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GROUPS AND ORGANIZATIONS IN WAR, DISASTERS, AND TRAUMA

DEPARTMENT OF PSYCHIATRY
F. EDWARD HEBERT SCHOOL OF MEDICINE
UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES
BETHESDA, MARYLAND 20814-4799

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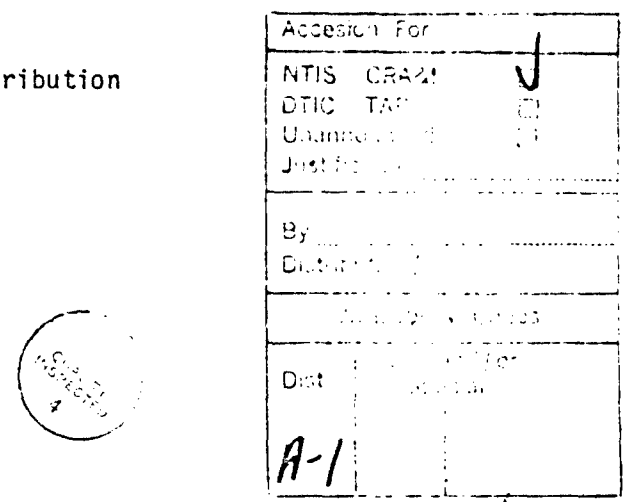

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The Antarctic environment is one which provides information on the difficult task of living in a contained environment. The ability to sustain oneself in small group operations with little contact with the outside for various periods of time is critical to the operations of contained, protected environments such as the Survivable Collective Protection System (SCPS) in a chemical and biological warfare (CBW) environment. The provision of medical care following the nuclear disaster at Chernobyl is presented in this volume, providing information concerning the stresses and coping strategies after toxic exposure. The ways in which threats are perceived and the experience of risk is mediated through group values, culture, and symbols. Risk perception is an inherent aspect of the CBW experience of threat, fear, and terror, one which will influence leaders and troops alike. Acute stress reactions to conventional and CBW military threat, particularly "classical" forms such as combat stress reaction (CSR) and post-traumatic stress disorder (PTSD), are discussed with regard to the psychiatric treatment roles of the medic, the medical aid station, the field (Cont'd)

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hospital and the rear echelon hospital. Lastly, the broad areas of responses to disasters and the development of psychiatric symptoms and the lack of symptoms in communities exposed to tragedies and disasters are examined. (SDW)

This is the fifth of six volumes addressing the psychological and behavioral stresses in a CBW environment. The titles contained are as follows:

The Controversy on the Mental Health Consequences of Disaster	Enrico Quarantelli, Ph.D.
Risk Perception	Mary Douglas, Ph.D.
Adaptation to a Contained Environment: The Antarctic Experience Applied to Chemical Warfare	Sidney M. Blair, M.D., Ph.D. CAPT, MC, USN
Treating the Chernobyl Victims: Individual and Group Responses of the UCLA Medical Team .	Richard Champlin, M.D.
Psychiatric Care of Acute Stress Reactions to Military Threat	Arieh Y. Shalev, M.D., Lt. Col., IDF, MC and Hanan Munitz, MD. BS.

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Other volumes in this series

Individual and Group Behavior in Toxic and Contained Environments

Performance and Operations in Toxic Environments

Individual Response to Disaster

Exposure to Death, Disasters, and Bodies

Training for the Psychological and Behavioral Effects of the CBW Environment

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PREFACE

This is the fifth of six volumes addressing the psychological and behavioral stresses in a chemical and biological warfare (CBW) environment. This volume presents the acute and long-term responses of groups and individuals to war, disasters and trauma. These papers explore the issues of resiliency, coping, leadership, medical and psychiatric care, and the perception and assessment of risk by individuals and communities.

The Antarctic environment is one which provides information on the difficult task of living in a contained environment. The ability to sustain oneself in small group operations with little contact with the outside for various periods of time is critical to the operations of contained, protected environments such as the Survivable Collective Protection System (SCPS) in a CBW environment. The provision of medical care following the nuclear disaster at Chernobyl is presented in this volume through a debriefing of Dr. Champlin, one of the physicians on the scene. His observations provide information concerning the stresses and coping strategies after toxic exposure. The ways in which threats are perceived and the experience of risk is mediated through group values, culture, and symbols. Risk perception, discussed in the paper by Dr. Douglas, is an inherent aspect of the CBW experience of threat, fear, and terror one which will influence leaders and troops alike. The development of performance decrements, illness, and performance enhancements in the face of such fear requires exploration. Acute stress reactions to conventional and CBW military threat, particularly "classical" forms such as combat stress reaction (CSR) and post-traumatic stress disorders, are discussed by two Israeli psychiatrists, Dr. Shalev and Dr. Munitz. Their discussion includes the psychiatric treatment roles of the medic, the medical aid station, the field hospital and the rear echelon hospital. Lastly, the paper by Dr. Quarantelli examines the broad area of responses to disasters and the development of psychiatric symptoms and the lack of symptoms in communities exposed to tragedies and disasters. Using his years of experience and his team's work with national and international disasters, Dr. Quarantelli reviews the literature in this area, presenting his findings.

The CBW environment presents unique and generic aspects of combat stress. Exposure to fear inducing agents, the necessity to work in a contained environment, and the fears and problems of contamination produce new and stressful aspects of the combat battlefield to understand and prepare for.

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THE CONTROVERSY OF MENTAL HEALTH

CONSEQUENCES OF DISASTER

Enrico L. Quarantelli, Ph.D.

23 July 1987

COL URSANO: I am very pleased to have with us Dr. Enrico Quarantelli. He is presently the Director of the Disaster Research Center as well as Professor of Sociology at the University of Delaware. We have been following Dr. Quarantelli's work for quite a while, as we attempt to build data bases on aspects of disasters and traumas that we have been most interested in. We became aware that he had amazing amounts of resources and talked to him a while back. Eventually, we spoke to him about coming to speak with us which he was so very gracious to do. I have made some comments to Dr. Quarantelli about each of you, but I think it would be helpful if you could introduce yourselves. Give your name and say something of where you are from. That way this will be much more informal.

DR. KATZ: I am an anthropologist at WRAIR (Walter Reed Army Institute of Research) in the department of Military Psychiatry and am currently studying drill sergeants.

DR. SHALEV: I am a psychiatrist from Israel. I am here as a visiting scientist.

CAPT BLAIR: I am a psychiatrist on the USUHS (Uniformed Services University of the Health Sciences) faculty. I am interested in confined environments or isolated environments, mainly the Antarctic.

TSGT CERVANTES: I am a research technician and I work with Dr. Ursano.

DR. SEGAL: I am a post-doc fellow in the department of psychiatry here at USUHS.

DR. SACZYNSKI: I am a clinical psychologist at Walter Reed interested in post-traumatic stress disorders.

LTC INGRAHAM: I am a social psychologist from WRAIR.

CAPT BARTONE: I am a research psychologist from Walter Reed in the department of Military Psychiatry. I am interested in disasters and human responses to disasters such as the Gander Military airplane crash in 1985.

COL HOLLOWAY: I am Chairman of the department of Psychiatry here, currently on sabbatical, and am principally interested in the overall problem of HIV disease. However, over the years, I have been interested in the impact of various sorts of disasters and unusual events on both military and civilian communities.

DR. FULLERTON: I am a research psychologist and I work here at USUHS with Dr. Ursano.

MR. DORAN: I am a research technician here at USUHS working with Dr. Ursano.

COL URSANO: That is the group. We are looking forward to your thoughts.

DR. QUARANTELLI: Thank you for inviting me here. I am not going to read a paper but I will talk somewhat informally from notes as well as from different papers. I was asked to talk on the topic concerning the controversy over mental health consequences of disasters. I will present two major points of view on this matter and follow with my professional point of view of which position I find most valid.

The issue is summarized in an abstract of a chapter I wrote two years ago, "An Assessment of Conflicting Views on Mental Health", in a book called Trauma and Its Wake. I will read three sentences here because it sets the stage for what I want to talk about. It says, "Students of this question are sharply divided on what they see as the psychological effects of community disasters. A minority argues that mental health effects are widespread, deep, persistent, long lasting and dysfunctional with the negative consequences similar to what can be seen in other stress situations. The majority of disaster researchers argue that while there are immediate widespread effects, much of the reaction is surface, non-persistent, of short duration, not behaviorally dysfunctional, and that there can be significant positive psychological effects."

This sums it up without any necessary qualifiers for these are the two major points of view that are involved. However, in part to indicate the way I am going approach this and the reasoning and the data that I am going to bring to bear, I have to tell you where I am coming from. My point of view is derived from social and behavioral science research that has been undertaken during the past 30 years. First, I want to talk about disaster studies in general and then I am going to focus more on the disaster studies that center around mental health aspects of disasters or the psychological effects of disasters. Let me give you a very brief history of disaster studies stemming from the social and behavioral sciences point of view.

For all practical purposes, no research was done in the area before World War II. There are scattered studies, but for all practical purposes, they can be ignored. The first systematic study was done in 1919 of the 1917 Halifax explosion. During World War II, there were a series of studies done which, from a historical point of view, are important in understanding the events of the war. These were survey studies done particularly on the strategic bombing in Japan and in Germany, as well as studies that were done at Hiroshima. These studies were done in an effort to see what consequences the bombing had on the Japanese and German populations. While many of the studies were of a highly technical nature, some of them did focus on the social and psychological aspects.

Generally speaking, the findings from a social and psychological point of view, demonstrated that the bombings did not have that serious of an impact. Morale went up rather than down. The bombings did not have a very serious impact on the social fabric or social structure.

From a disaster studies viewpoint, it is fortunate that these findings were ignored. Following World War II and the immediate years following, several agencies within the U.S. military began to raise what they considered the two new potential problems concerning the long run future of the United States. One, of course, was the development of the atom bombs. The second was that following World War II, there was a feeling that up to that time the U.S. population had been spared the stress, never coming under direct attack by a bombing or anything else. The Japanese sent a few balloons over, but that was the extent of it. Thus, various people in the military raised the question, "How would the American population bear up under not only a direct attack,

but also a direct attack which might involve atomic weapons?" Especially since at that time, atomic weapons were being developed and tested.

They ignored the earlier studies which suggested that the results of a bombing might not be that bad. At any rate, the military was concerned with these problems. Members of the Army Surgeon General's office, the Army Chemical Warfare Office, and a few other military officials raised the questions, "How can we learn anything about this?" and "How can panic be prevented in the American people as a result of coming under direct attack, particularly if atomic weapons are used?" A major problem was that there was no direct information about this. There were certain anecdotal and empirical studies from Hiroshima, but basically, there were no direct studies.

Without going into the details of this, several agencies thought the best way of studying this was to look at civilian disasters in American societies and try to extrapolate from the civilian disasters those issues pertinent to a potential wartime situation. Beginning in 1949 and continuing through the early 1950's, several military organizations commissioned studies to look at civilian disasters. The first major study was done at the University of Chicago with the National Opinion Research Center and was sponsored by the Army Chemical Warfare Service. This is when I personally got involved in the disaster research area. Its basic question was, "What could we learn from civilian disasters to prevent the panic and social disorganization that would occur if the American populace was subjected to a direct attack?"

Although there were certain suppositions about what would happen and what would not happen, a whole series of studies were generated. These studies started out with the notion that the problems occurring after a disaster would include personal breakdown, social disorganization, and an image that, in general, the population would bear up rather poorly. This was the imagery that most of the earlier researchers had in mind. However, it only took a couple of years of extensive studies to come to the conclusion that the basic question being asked was wrong, and that the basic model or assumptions being made were fundamentally incorrect.

What was the basic theme of the early research? This early research has become the hallmark for future disaster research. The mobilization of field teams and sending them out to the site of the disaster as quickly as possible was the chief tool. This involves arriving at the site while the disaster is still going on, such as a flood, or in certain cases, even getting there before the disaster actually occurs, like in the instance of hurricanes approaching an area. Again, the key was sending field teams out as quickly as possible. These studies are based not on historical data, but on field research.

The studies done at the University of Chicago, as well as those independently done at University of Oklahoma, the University of Maryland, and a few other places enabled researchers to quickly arrive at certain basic conclusions. The overall theme was that, in disasters, there was little personal or social disorganization. The notion that you have panicky people experiencing panic flight, simply was not borne out Anti-social behavior, manifested in terms of looting, was also not borne out. The impacted population, rather than simply sitting there stunned and waiting for outsiders to come in and help them, actually acted in a much more proactive fashion, trying to do what they could given the situation. Those individuals who had roles of responsibility did not abandon those roles. The notion that there is a role conflict between one's responsibility to family versus responsibility to an organization was non-existent. In fact it is difficult to find an actual case where anyone has ever abandoned a role of responsibility in a disaster situation. Search and rescue were undertaken and completed by the friends and neighbors around the impacted area while the organized search and rescue groups played a more minor role. The general picture is that individual victims bear up remarkably well under the metered stress of disasters. The focus of the studies, however, was on the emergency period only.

In many respects, the problems that were generated, both in the short and long run, were not those of the victims per se, but were actually problems that stemmed from

the poor response to the organizations that came in. They did not deliberately want to increase the problems or generate new ones, but frequently did. In more technical terms, this is discussed in the disaster literature as the problems being not agent-generated as much as being response-generated. Agent-generated problems carry the notion that the disaster agent, whether it be a flood or a hurricane, does certain kinds of things which in turn create problems. The argument is that many of the problems that develop in disasters as a result of the convergence of the organizations that come in to help, are either from within or from without. For example, when Wilkes-Barre was hit by a flood, 20,000 people had to be evacuated. The flood was very devastating. From a disaster point of view, this was probably one of the worst disasters ever to hit American society. Our studies, as well as the studies of others, showed that the problems were not so much the fact that people had to leave because of the flood threat, (all but four houses in the city of Wilkes-Barre were damaged in some way) but rather it was that the massive effort that was organized in order to help them was simply inappropriate. For example, people were kept away from their homes after the disaster although they wanted to return home. The insistence was to set up mobile camps elsewhere, totally disrupting the social fabric.

At Buffalo Creek, another classic case of a catastrophic disaster in American society, a social scientist looking at the massive relief efforts said the following, "The end result insofar as rehousing was concerned was what might be expected if a brilliant madman set about in most ingenious ways to maximize personal and social pathologies." He was saying that the problem was brought on by the helpers. They managed to do everything wrong. That is probably the worst handled disaster in American society. Though not deliberate, the results are the same whether one looks at the local, the state or the federal effort.

The basic point here is that the earlier studies which were then confirmed by the later studies, essentially argued that what one really has in disasters is that individual victims were not the source or locus of the problem. In fact, the term "victims" is a loaded word. Later research argues that the term "victim" ought to be an empirical matter rather than assuming it as a given just because someone has been in a disaster situation.

Two basic themes arose from this early social science research. Although somewhat unqualified, one was that people bear up remarkably well under the acute stress of disasters. We will add later that the term disasters is a tricky word. The second theme that came out of this is that while individuals bear up rather well and generally rise to the challenge, organizations do not cope and adapt well to disasters. As a result, they very often are the source and the locus of many of the problems in the post-disaster period.

During the last 20 years, especially the last decade, disaster research has accelerated considerably. For example, the Disaster Research Center, started in 1963, has studied almost 497 different mass emergency situations. Most of the focus has been on both the emergency time period as well as on the organizations involved in the situations. There have also been studies ranging from laboratory studies simulating radio rooms under stress to population surveys of individuals in a stricken locality. At the present time, the Disaster Research Center is not the only one involved. There are all sorts of other people doing research. In fact, there is an international research committee on disasters that has members in about three dozen countries around the world. Last year, they had a meeting in New Delhi, India which was the first one of its kind.

The point here is that with respect to looking at disaster behavior, in terms of the mitigation, preparedness, response and recovery phase, most of the work is really focused on the preparedness and the response phase. There are far less studies on the mitigation of prevention and the recovery phase, but what there is constitutes a fairly solid body of knowledge. The scholarship in the area is not very good, however, the knowledge is fairly solid.

The basic theme of both earlier and later research is that when one is looking at individual or organizational disaster response, contrary to the image of earlier researchers and inexperienced people, disaster response is very heterogeneous. Behavior under stress, whether on the part of individuals or organizations, is not a matter of either/or. There is considerable variation.

A second theme, again contrary to the earlier imagery and the imagery that I personally started out with, involves panic behavior. My Master's thesis was on panic behavior. I was going to write the classic study on panic and then I had a devil of a time finding enough cases to even talk about. Many of the responses which are assumed to be inappropriate or bad, that is, taking the form of panic, looting, hysteria, shock, and personal breakdown and either social disorganization, simply do not occur. Some responses are dysfunctional, but not all of them are.

This is an empirical matter in the sense that what happens is either functional or dysfunctional. I will address in on this later when we turn to the mental health area because this is the part of the controversy one looks at. If one looks at behavioral dysfunctionality, one can make the case that there are very few severe consequences of disaster. If one looks at non-behavioral consequences, then one can make more of a case that something happens as a result of a disaster. I will get to this later.

A third theme is that disaster victims not only respond to the disaster agent but also are affected by the response context in which the disaster occurs. In fact, they are more affected by this than by the agent itself.

The fourth theme has both practical as well as theoretical and policy implications. If one wants to do something about the response in disasters to make it better, whether the person is talking about individuals or organization, to direct resources and develop programs, where does one focus? One could focus on trying to deal with the populations or with individual victims, or one can take the point of view that this is not where one is going to get the greatest payoff in the long run. What we are talking about has important policy implications involving where efforts ought to be directed, not research efforts as much as efforts in terms of if one has limited resources. Where does one take the limited resources and put them into the situation? There will be certain implications of this discussion as to where the resources ought to be designated.

In terms of the mental health area, the general expectation is that things are bad and people react poorly. To illustrate this, and to see how it continues in the absence of any knowledge, one can get a picture of what is involved by how the mass media reports on disasters.

If you go back to the late 1800's and early 1900's, you would see statements similar to the following. In an 1889 Harper's magazine article, the survivors of the Johnstown Flood were described as crazed by their sufferings. The Saturday Evening Post account of the devastating hurricane that hit Galveston, Texas in 1900, described it as the worst disaster ever to hit American society, including a report of 500 people who went insane almost in unison. Similarly, Harper's Weekly wrote that the 1906 San Francisco earthquake and subsequent fire brought about cases of men gone mad. These were the mass media reports, obviously reflecting the popular belief of the day.

These general beliefs have been carried over into more recent years. For example, in 1973, Newsweek, reporting on the Hurricane Agnes floods, reported that once the immediate post impact period was over, a new reaction started to appear among the victims. This was described as "a kind of sheer psychosis that just hits about everyone affected directly or indirectly by the event." The story goes on to assert that within a few weeks of such a catastrophe, "symptoms of emotional problems become disturbingly obvious, the number of successful suicides rise about a third, hospital admissions for psychiatric reasons run at double the normal rate, and the frequency of accidents skyrocket." The more recent Mount Saint Helens volcanic eruption has generated press comments to the effect that "wife battering is up, so are suicide

attempts. The volcano's impact on the mental health of hundreds of thousands of the residents of the area will be serious and long lasting."

These mass media accounts are cited to indicate what the popular imagery is, both in terms of the past and the present time. But what do we have by way of actual, systematic mental health studies? There are not that many. There have been about two dozen events in which there have been systematic mental health studies. Those events in which some sort of mental health evaluation has been done after the disasters include: The Big Thompson flash flood in Colorado, the Buffalo Creek Dam flood, the Los Angeles earthquake, the Monticello, Indiana, tornado, the Mt. St. Helens volcanic eruption, the Omaha tornado, the Rapid City flood, the Rochester, Minnesota, flood, tornadoes and floods in the St. Louis area, the Teton Dam collapse in Idaho, the Three Mile Island nuclear plant accident, the Topeka tornado, the Wichita Falls tornado, the Wilkes-Barre flood, and the Xenia, Ohio, tornado. There have been a few others since that, but basically we are talking about only a handful of studies.

This does not mean that in passing, mental health issues have not been looked at by other researchers. I do not totally dismiss that kind of thing. If in terms of looking at something, nothing ever appears, even without systematic studies one can reach the conclusion that probably the phenomenon is not very important. For example, I have not yet been able to find an authenticated case where somebody in a position of responsibility abandoned their role in order to worry about their family. You would think that even in an anecdotal basis, such a case would appear. However, I will not deny that perhaps there is a case somewhere. Apart from the systematic studies, I have not seen a study that has directly focused on this kind of issue, yet it is a problem in which a great deal of time, effort, and resources have been spent. For example, there is a major issue surrounding the Shoreham Nuclear plant as well as other nuclear plants concerning evacuation procedures. One of the big arguments is that you will not be able to depend upon the bus drivers and the school teachers to aid in the evacuation if there is an accident because they will abandon their roles. Yet, there is not a single bit of evidence in the disaster literature that demonstrates that people are going to abandon their roles.

What I am trying to indicate here is that two dozen systematic disaster studies as well as a supporting body of the much larger set of studies, which do not directly focus on psychological and mental health problems, tell us something about what is going on.

One immediate problem is the operational definition of a disaster. This is a very difficult conceptual problem. Part of the problem stems from the fact that people who use the term disaster use it in very broad terms. They cover everything from the Holocaust to hostage taking to war situations to practically every individual and collective misfortune you can imagine. With such a broad reference and all else being equal, the broader your definition is of an event, the more likely you will be able to find something. But apart from that, there is something of a much more fundamental nature involved.

The consequence of this is that most disaster researchers, not because of the mental health issue, but for other reasons, essentially are talking about a specific type of phenomena when they are discussing disasters.

There are a whole variety of extremely stressful situations that affect people, communities, and groups. Some of these are in terms of things that affect a single individual. For example, somebody's wife dies, or somebody is in a traffic accident. These are individual extreme stress situations. These are different from collective stressful situations. Most disaster research indicates that the individual stress situations are something totally different along many lines. They are interested in the collective stress situation, but even in a collective stress situation there seems to be a fundamental difference because they may be collective in the sense that groups are involved in being subjected to the tread. People draw a distinction between disasters and conflict situations. This is not simply arbitrary. The Disaster Research Center did studies during the civil disturbances in the United States between the riot behavior in the riot

situations on campuses and in the ghetto areas and what was defined as the more internatural disasters and technological disaster situations.

The fundamental difference between the two is not just a matter of definition, but that in a conflict situation there are conflicting parties. That is why one calls them conflict situations, whether it be war, a hostage taking situation, a concentration camp situation, or a riot where one of the parties is deliberately trying to inflict damage or destruction to keep the situation going. A conflict situation by definition involves a degree of intentionality on the part of an individual to either keep the situation as bad as it is, or to make it worse.

For most disaster research, this is not the factor that is involved. These are both theoretical and practical consequences. For example, we studied hospitals' operations in riots, as well as hospitals' operations in natural and technological disasters. They are two different kinds of situations. In a riot situation, casualties tend to be spread out, whereas during disasters, they tend to peak and then drop off. The hospital in a riot tends to get caught with those people who are on duty at the onset of the riot. Workers from the other two shifts cannot get in to work because of road blocks and curfews. In a riot situation, there are some very interesting ethical problems that arise. A black rioter is brought in and refuses to be treated because it is a white person who is doing the treating or vice versa. Also, both rioters and police officers are wounded and brought into the emergency room where they start fighting with one another. These types of behaviors are not exhibited in natural or technological disasters.

Basically, the argument is that they are collective stress situations and to that extent share certain things in common with all stressful situations. However, in the real fundamental sense, one has to separate disasters from conflict situations. Furthermore, when one is talking about disasters, there are two very rough categories. One might talk about disasters as either community type disasters, or non-community type disasters. What do we mean by non-community type of disasters? An example of a non-community type disaster is the typical transportation type of accident where the parties involved went down in an airplane and survived the crash. Another example is the Amtrak train crash that happened not far away from here about a year ago. The victims come from different areas and when they go home they go to all sorts of different areas. There is no sharing of the disaster. A community type disaster, on the other hand, is something where a great number of people undergo the event together. One of the consequences of this is that there is the identification by the people that "we underwent this experience." Furthermore, there is a strong social support system helping the victims. A study in Australia illustrates this rather well.

Darwin, Australia was hit by Cyclone Tracy several years ago. Darwin was very badly devastated physically. The Australian government had to decide whether to evacuate most of the people in Darwin or not. They made the decision to try to evacuate most of the people, although they did not force people out if they did not want to go. Most of the people were taken out, but some remained in Darwin. Some people left Darwin and then came back following the cyclone, while others were still away in Sydney and Melbourne two years after the disaster. Some psychologists and social psychologists in Australia decided to make a study about these victims. They wanted to find out which evacuees were better off two years after the events. The various studies demonstrated that the evacuees that never left Darwin had the least amount of problems. The evacuees that had left Darwin and come back were in the second level, and evacuees who were still away from Darwin were the people who demonstrated the most problems, although they were in much better condition. This better condition was due in part to not being in a physically devastated community.

In terms of the Australians, there are several reasons why those who stayed in Darwin had the least mental health problems. Firstly, there is the idea that if you are in a familiar place you experience less stress. Furthermore, they identified with the other people immediately around them, indicating the presence of strong social support

systems. The Darwin evacuees that went to Sydney and Melbourne and to various other places in Australia, were living in a place where nobody else had shared the experience with them. They had no social support.

So the community versus the non-community disaster notion is an important one because in a non-community type disaster, one can assume that there is not likely to be the sense of a commonly shared experience. Also, there is not likely to be the social support system. There are other aspects that differentiate the two aside from the mental health area that I will not go into at this time.

My point is that when most disaster researchers address the issue of mental health or psychological consequences of disasters they are basically talking about this community type disaster. It is this type of disaster that they are talking about while these types of disasters which tend to have missed communication among researchers with different points of view tend to be non-community type disasters. An example of this is when one researcher is talking about concentration camp victims, while someone else is talking about a riot or a wartime situation. It is fortunate that most disaster researchers are not talking about those types of disasters. However, even among disaster researchers there is not total consistency or consensus in what constitutes a disaster. In terms of what I am talking about and in terms of at least a majority of disaster research, a disaster is community oriented.

It is not as much a question of how to label a disaster, as it is a question of how one wishes to give meaning to the situation. One has to have a concept which has boundaries and about which at least the people that are using that concept can agree. We must keep in mind that when I am talking about disasters, that is what is involved.

For example, if someone tells me that the Amtrak train crash survivors might have certain psychological problems, I think a case can be made that, at least on a theoretical basis, they are much more likely to have problems than the people who survived the tornado in Xenia.

I will focus on the two positions, the individual trauma approach and the social sponge approach. I concocted these terms because these labels capture the essence of what is involved.

The first position, the individual trauma approach, holds the position that disasters are highly stressful. They are traumatic life events and anyone who is subjected to them will be affected by them. This includes not only the people who are directly affected by the disaster, but the people who have indirect or direct contact with those who are directly affected. The effects are very pervasive. They will be deeply internalized, and the effects will be basically negative. The disaster victims are seen as primarily attempting to cope with the meaning of the trauma as well as the disaster impact. It is primarily thought of in terms of individual coping and therefore given the label of individual trauma, seen as a highly stressful traumatic event, resulting in certain negative consequences.

The second approach, the social sponge approach, basically holds that community disasters have differential rather than across the board effects. Some of the effects are positive as well as negative. In terms of the negative effects, they are most likely to be short in duration. Furthermore, many of the problems victims have stem less from the trauma of the disaster event itself, but rather from the problems they have in coping during the post-impact period with the bureaucracy that is involved and with the policies and decisions that are made by all sorts of agencies.

I talk about this as a social sponge approach because a sponge is an elastic, porous mass of interacting fibers. Under all kinds of pressure it maintains its structure and then returns quickly to its usual state. It can absorb very large amounts of various liquids and other materials and even when wet will not lose its toughness. What I was trying to convey by the notion of social sponge is, like a sponge, the community can take a great deal of pressure, yet will eventually return to its basic structure. If the sponge is thought of as being analogous to a community, and the interlacing fibers of the sponge

are thought of as a social fabric within which everybody in a community is embedded, the imagery of what is involved is fairly clear.

Let us try and spell out why the differences between the two approaches exist. What do the individual trauma approach and the social sponge approach argue? The individual trauma approach argues that everyone is affected in an essential way. For example, in Buffalo Creek, it was reported that the psychological impact of the disaster had been so extensive that no one in Buffalo Creek was unaffected. The overwhelming evidence is that everyone exposed to the Buffalo Creek disaster had experienced some or all of the following manifestations of the survivor syndrome including anxiety and permanent inner terror, guilt over having survived, psychic numbing and depression, impaired human relationships, and an inability to find an explanation of what happened. Lifton and Olson stated, "Our observations were all too consistent with the body of recent experience with massive psychic trauma, war, revolution, concentration camps, and severe disasters. Psychiatrists have regularly observed that psychological impairment can result in virtually anyone independent of estimates of predisposition."

The theme here is one in which everyone is affected, and not at the superficial level in terms of some of the things they talk about. Titchner and Kapp state, "Disabling psychiatric symptoms such as anxiety, depression, changes in character and lifestyle, were evident more than two years after the disaster in more than 90% of our respondents."

In contrast to this pervasiveness, there is the social sponge approach. Let me cite here a report from Xenia. Xenia, Ohio was very badly devastated by a tornado. Fifty percent of the people's homes were either destroyed or badly damaged; 33 people were killed and 1,200 people were injured out of a population of 28,000. By any criteria, this was one of the worst disasters in American society in terms of the size of the town that was involved. A number of people have studied it. We did a six month and an 18 month study after the disaster using a population survey.

The study found there was an extremely low rate of mental illness, if any, as a consequence of the tornado. On the contrary, the summary report concluded that a large percentage of the people had extremely positive reactions to the disaster. Eighty-four percent of the people claimed that this experience demonstrated to them that they could handle crisis better than they thought. Sixty-nine percent reported that they felt as if they had met a great challenge and were better off for it.

Changes in the quality of social relationships are often thought to be related to changes in emotional well being. Yet, only 2% of the population admitted to a worsening of relationships with close friends and family after the tornado. Instead, 27% claimed that such relationships had improved. Similarly, 3% found their marital relationships less satisfying after the tornado while 28% reported them to be more satisfying. There are other statistics, but the theme that comes across here is that the social sponge approach argues that while there can be both specific or varying types of effects, for the most part they are not profound. They are not long lasting and many of them are quite superficial.

Proponents of the individual trauma approach frequently argue that self reports cannot be trusted, and that is true. The analysis done in Xenia found that independent behavioral indicators supported what victims had self reported. They were consistent with the interview remarks. There was no overall change in the marriage and divorce rate after the tornado. Agencies that provided treatment and hospitalization for serious psychiatric problems actually reported a decline in the demand for their services. For example, the state hospital facility, which was most likely to be used, reported a 30% drop in admissions during the year following the tornado. Similar declines in demands for services were reported in other area organizations specializing in long term clinical treatment such as psychotherapy, drugs, or hospitalization. There was also a significant drop in liquor sales in the two state monopoly stores in the Xenia area during the six to twelve month period after the tornado. In Xenia, we not only looked at the community

services offered, but we gathered every conceivable indicator, including movie attendance, prescriptions for drugs, traffic accidents, divorce rates, etc.

Thus, the overall picture that comes across is that the individual trauma approach views the disaster as pervasive, deep, important, long lasting, and probably never forgotten. The social fabric approach, on the other hand, agrees that there are some consequences. For example, in one of the very early studies of disasters in 1954, using a population survey, 49 % reported nervousness, excitability, and hypersensitivity, 46 % reported sleeplessness or poor sleep, 37 % reported inability to concentrate, 29 % reported loss of appetite, 19 % reported headaches, and 18 % reported anxiety dreams and nightmares. The argument is that these consequences do not last, are not behaviorally dysfunctional, and fundamentally people get over these relatively quickly without anybody doing much of anything.

We have two basic positions, the traumatic approach and the sponge approach. Let me turn to what accounts for the differences between these two positions.

COL HOLLOWAY: In reference to the statement that you just made, you said, "without anyone doing very much of anything," is your assumption directed to neighbors and friends?

DR. QUARANTELLI: No, I was referring to organized efforts to do something for the people. One of the things that consistently comes out after one of these disasters is the rate of interaction. Social interactions with family increases and the rate of interaction with friends frequently increases, although not all the time. There is a pulling together of people.

In Xenia, there was an outreach program that tried to find people with problems as well as other kinds of programs. In one of the studies we did, not the survey, the state of Ohio asked us to make an evaluation of the various programs that were instituted in the schools, as well as the various other organizations because the federal government would provide money. We had a difficult time making any evaluation because nobody was using any of the services.

COL HOLLOWAY: That statement refers then explicitly to formal helping agencies.

DR. QUARANTELLI: Yes, either they were already in place or they were specially put in place by the National Institute of Mental Health (NIMH). We have done a number of studies for NIMH. The crisis counselling program at NIMH under Mary Listad's operation, can go in and take care of the individual's requests for help in federally declared disasters. This occurs frequently over the strong objections of the local mental health people. This is very interesting, but it does not have much consequence because very few people used the services. For example, only 3% of the people in Xenia used this particular program. There were many agencies in the area with either old programs or new programs and what comes out is almost absence of use of these programs.

Some of this may result from the ineptness of some of these programs. If you hang out a shingle as some people used to do in the disaster relief center, or the one stop centers and say, "Mental Health or Psychological Counselling," it is not surprising that victims stay away in droves. No one goes up there because as victims tell us, "I am not going to go up there and say I am crazy." They are fearful of being identified and labeled as being crazy. It may be incorrect, but that is the way the disaster victims identify mental health or psychological counselling.

COL URSANO: It is interesting in that the way you discuss it may affect how you approach the topic. I find myself cutting across categories. You are speaking to an

audience which in fact would concur with you that yes, psychopathology occurs, and no, it is not rampant in disaster settings. In general, in disaster settings that are, as you would label them, "conflict settings," people do not run in droves to mental health settings.

DR. QUARANTELLI: They run from them in droves.

COL URSANO: Yes, frequently the questions asked involve what are the natural recovery processes present in a community and whether or not those are being interfered with in any given setting. This can occur whether or not you are looking at the individual or group. The question is whether or not the natural recovery processes are being interrupted rather than whether or not one is introducing something new.

DR. QUARANTELLI: I will make a comment later regarding the conflict situation but it would be better to put it in that kind of context. Although we have not done any mental health studies in conflict type situations, there are a number of European colleagues who have. They have raised some questions about whether even in the conflict situations things are always that bad. Recently, a Norwegian psychiatrist investigated an oil rig type of disaster.

COL URSANO: Are you speaking of Lars Weisaeth?

DR. QUARANTELLI: No, it was somebody who works with him. He stated that it was far more complicated than it may have seemed on the surface and that there were both positive and negative affects.

COL URSANO: An example of this is when one looks at POW's. An article published by William Sledge showed better than 60% of the people in the report had benefited from having been prisoners of war. In the studies of individual cases of POW's, you can show evidence of growth from the experience. These clearly are examples that match across the boundaries that you are talking about.

DR. QUARANTELLI: The basic principle is that some people, when faced with this kind of challenge, whether individual or collective stress, rise to the occasion and are better off. The premise that disasters are seen as totally negative is simply not true. We have done studies of the organization, the community, and indirectly at the state level, and found that some organizations are far better off after a disaster. Some communities are better off as well. When the Alaskan earthquake occurred, a number of the ports and fishing villages along the coast were devastated. This was basically quick urban renewal. They are far better off than they ever would have been in terms of natural sequences. The people were better off even in terms of certain other kinds of situations on a larger level.

In other words, there are positive consequences to disasters, and to label the disaster in negative terms is a matter of definition. It is an empirical matter whether disasters are negative or positive because one can always find negative and positive consequences. This can be put into a larger context. Because of ideological and ethical reasons, there are certain kinds of events, such as wars, that have to be bad. Along certain lines it definitely is bad, but one could argue along other lines that war is good.

Similarly, in terms of disasters, it is an empirical matter to ascertain the positive and negative outcomes. When a student of mine did a study of the Teton Dam disasters, she raised the question about the term victim. The term "victim" is automatically imposed. People who undergo disasters become victims. She did follow-up studies of the Teton Dam disaster. The area that was impacted was mostly Mormon country, and the Mormons have very strong support systems for members of their own groups. With

the Teton Dam disaster, the problem was not the Mormons. They did a much better job than the federal government in helping their own people and even some people outside of their church. The people that had problems were people that fell outside of the helping pattern and thus the outsiders did have consequences. It was not because of the impact of the disaster but because people did not get money to pay the mortgage or recover lost capital as well as a whole variety of other types of things.

DR. KATZ: In many of the disasters that you mentioned, particularly in an American context, they seem to be discreet events with finite findings. I wonder whether or not disasters which are not so carefully defined, particularly as to their end, such as consistent wartime situations or even Three Mile Island have the same issues surrounding them.

DR. QUARANTELLI: I was just going to cite Three Mile Island as an area that has been studied. This is one, which along with Buffalo Creek, has been very strongly disputed. There have been a number of studies of Three Mile Island ranging from very sophisticated to rather superficial. It is the most studied disaster in history, if it indeed was a disaster. But, that is part of the point. Was Three Mile Island a disaster? Some people would argue that this is a continuing stress situation. For example, one can look at the studies that were made by George Warheit, an excellent epidemiologist from Florida. He analyzed all of the published and unpublished studies of Three Mile Island and concluded that some of the findings were inconsistent. However, when he took what he thought was the more valid data, it seemed to indicate that the effects of the accidents were of a subclinic type. They were short-lived and self-remitting and "there are not scientific data which support the belief that the accident produced measurable levels of gross psychopathology." Another study in the area which was looking at the consequences of the economic recession on families, came to the conclusion that the economic recession had far more negative psychological affects on families than did Three Mile Island. Other people say that it is a continuing problem, which is the basic issue. It is a problem which probably has continued for a variety of reasons, including some groups that want to maintain it as a problem for ideological reasons. That, however, is different. The point I am trying to make is that even the studies made in continuing situations do not bear out that the consequences are that different.

The results do not bear out that there have been severe psychological effects of a persistent or enduring nature. The Warheit statement includes a few studies that do suggest some things. When he put everything together it gave greater weight to that which was the more valid data. He concluded that severe psychological effects just are not there. If they are there, they certainly are very subtle.

DR. KATZ: There is a question about methodology with this. It is more comfortable to deal with very strong psychopathology in an immediate context. It is easier to measure and you are better able to demonstrate that this has some severe effect, but you do not see the persistent low level effects. If you start looking for this, you might find quite a bit of it in many of these people. It is harder to measure and it is not regarded with the same degree of alarm, but the long term effects might in fact be equally severe.

DR. QUARANTELLI: Yes, but there is another element that I want to get back to. If one takes seriously some of the NIMH surveys about mental health in this country, in any given American community on any given day, 25% to 30% of the people, according to them, should be getting some type of mental health treatment. When you go into a disaster area and find people with some problems, the question is whether these problems are associated with the disaster or are simply what you would find anyway.

This refers to a point I made earlier in talking about outreach programs in some of these disaster areas. Some of these outreach programs find people with problems. In fact, in Xenia, they did find some older people with problems. What became clear was that these problems were not so much generated by the disasters, but that these older people prior to the disasters were either incorporated into friend, family, or kin groups which were having no problems getting along well. The disaster then disrupted the groups and they could not live with their family or they were taken away from their friends. When the outreach programs went out there, they found people with these problems. One could argue that these problems were not generated directly by the disaster, but that they were only reacting to the impact of the disaster. These were people who were socially supported on an everyday basis and could function very well but then had problems when separated from family and friends. The outreach people who did this were sophisticated enough to recognize that what they were finding were things which on an everyday basis were handled well. The disaster removed some of the conditions which allowed some of these people to function, but it was not the disaster itself that created the problems.

I will now return to what accounts for the two positions because some of the things that you mentioned about methodology are involved. There are six different possible lines of explanation. One line of explanation is that with relatively rare exception, the individual trauma people and the social sponge people have studied different kinds of disasters. One could argue that statistically it seems unlikely that they are reporting actual differences. When people looked at Buffalo Creek, there were phenomena there as well as when they looked at other kinds of situations. There would be something odd from a statistical point of view, if the result here is simply that people found differences in certain disasters over other disasters. Three Mile Island is the only one in which we have proponents or exponents of both positions that have looked at the situation. Another example, to some extent also, is the Wilkes-Barre flood. There were studies coming to different conclusions with what appears to be almost the same kind of data.

For example, during the same day in the Logue's study, various stressful experiences during the recovery period following the Wilkes-Barre flood were better predictions of mental health status measured five years after the event than the actual disaster impact. There is, in terms of the response, the social support. The Wilkes-Barre flood became far less of a predictor. This was a study done on a five year basis.

We can dismiss that the studies are reporting actual differences. It is a possibility, but it seems unlikely since Wilkes-Barre and Three Mile Island still show the inconsistency. A second explanation has to do with what is taken as acceptable data as well as the data gathering techniques used. Though there are exceptions to this, the individual trauma people tend to use a self selected population as well as clinical data. The social sponge people tend to use population samples through the use of surveys. Although the social sponge people also tend to be a little skeptical of survey data, they are so sophisticated that frequently they try to get the indirect indicators. This includes divorce rates, wife battering cases, child abuse cases, drug usage, etc. In the Xenia tornado, we had 45 different behavioral indicators. We did not get the movie attendance, but it would not have changed the overall picture of what we found. It all depends on what one accepts as valid data and valid methodology.

A third point, related to the second point, is the interpretation of the data. Part of the problem is that the individual trauma people frequently seem to have their cake and eat it too. For example, very often denial of problems is taken as an indication that there is a problem. I used to be a social psychologist. I taught social psychology from a psychoanalytical position and discovered that you cannot win against psychoanalysis. If you deny something, that is taken as an indication that the issue invariably exists. Schulberg wrote an article in 1974 that said, "Even though there has been no loss of human life, one can expect a predictable sequence of such behaviors as shock, guilt,

anger, and grief to occur on affected persons over a six to twelve month time period. A disaster victim's failure to display these normative reactions should not lead to the conclusion that all is well. Instead, it should alert the care giver that the victim potentially is employing maladaptive resolutions." Denial becomes the indication of the symptoms of the problem.

The social sponge people are not that naive in terms of accepting self reports. They use these other kinds of indicators. For example, this is a study we did in Xenia which has never been published. This study was conducted six months after the Xenia tornado hit and was done in conjunction with some of the outpatients through the outreach programs as well as some of the mental health agencies as a massive population survey in Xenia. We did a 15% study of the families in the Xenia area. On the doorstep we subjected them to a lengthy interview which in most cases took about three hours to administer. In the interview, not only were there all sorts of open ended questions and structured questions, but there were also varying types of mental health scales. We used one of George Warheit's mental health scales which he had standardized on a population elsewhere in the United States so we would have some data against which to measure the Xenia population.

We collected all of this data from the Xenia population. A year later we went back because one of the statements that is frequently made by the individual trauma people is, "You do not frequently find anything there. It surfaces, particularly a year later around the anniversary of the event." They also state that it takes a long time for the problems to work their way out. Thus, we did a study 18 months later. We resampled the households we had studied earlier as well as gathered information on an additional population for control purposes. We had very good response rate of 70% to 80% for the study.

Looking at the mental health scale data, there was no doubt that the Xenia population, both at six months and 18 months after the disaster, scored well over the national sample that Warheit had built his mental health scale on. The Xenia people were way over. There was no dropping off either at six or 18 months later. It was also clear that there was a correlation with the degree of impact. The people in Xenia whose homes had been destroyed, or who had a family member injured, had higher scores than the people who did not have this experience, through six months as well as 18 months later.

CAPT BLAIR: High scores are good?

DR. QUARANTELLI: No, it means they had problems. In other words, their scores indicate that they had problems. Whether one looks at it as measured against the national sample, though it was not quite a national sample but was a non-disaster population, in terms of victimization, or in time, there was no doubt that "The victims in Xenia who had the worst experience had high scores and the high scores remained 18 months after the disasters." You did not even need to conduct statistical tests on the data, the data stood out. You simply had to look at the frequencies.

We concluded that in Xenia, overall, there were no psychological or serious mental health problems because there were other kinds of data, particularly the behavioral indicators. We had, for example, questions relating to interruptions of work that asked if people took more time off work. We also had questions about family behavior, about the kids in school, and a whole variety of items of that kind, as well as all the other behavioral indicators that I mentioned. With a few minor exceptions, these indicators showed very little difference six months or 18 months after the disasters. When we could measure against pre-impact time, there was simply either a continuation of a trend or a minor variation around it.

The behavioral indicators did not indicate problems. Obviously, this is a matter of the one's strategy in terms of interpreting and analyzing. Our mental health scale

score indicated that for anybody that undergoes a dramatic event like a disaster, this event is forever embedded in their memory and in their being. For example, I will not forget my combat experience during World War II. In that sense, it remains part of one's life as it comes from one's life experience.

On the other hand, when we looked at whether or not this had negative consequences in terms of interaction within the family, in terms of one's work role and in terms of one's everyday role, we could find practically no indication in all the behavioral indicators that this had negative consequences. Our argument and the arguments of others is that if we are talking about how the consequences of disaster disrupt the functioning of the individual or of the family, we have little or no evidence from the Xenia data. That is a more solid data wall, but there are other kinds of data.

If you simply look at the mental health scores, you could say that these people have problems. Obviously, they are "suffering." This is part of their psychic make-up. The argument is, "If this does not have consequences in terms of their everyday life, then I am not going to be terribly worried about it."

COL HOLLOWAY: So the difference is whether you are Presbyterian or not.

DR. QUARANTELLI: Yes, that is true. It is a fundamental value judgment. If you do not have behavioral consequences, I am not going to worry too much about it. It may be there, and for all I know, I have been seriously scarred by the fact that the Germans once shot a bunch of 88's at me. They zeroed in on me, but as far as I can tell, that has not affected my behavior. If I have problems, it is not because of that experience in the war but because of other experiences.

Thus, one possibility for the difference between the two is simply the way in which one looks at the indication of problems. One can simply take a "what I say attitudinal" or just focus on psychological features of characteristics. I am not worried about those. I am more concerned with behavioral characteristics where one can see a person's behavior or a person's behavior in relation to others. Our own data, which is probably the most thorough, is probably most supportive of the individual trauma approach. This is largely due to having six month and 18 month data in terms of the mental health scale. It was an excellent survey, done well with very high return rates. Nobody else has data that solid. Despite that, we still argue that in Xenia we do not have any real evidence of problems because of the other types of data.

Another possibility is that mental health practitioners and professionals have different objectives as well as different ideologies. For many mental health practitioners, part of their ideology is to help people out. If an area has no problems and that only 1%, or 200, of the people have been affected, then it really does not matter from the viewpoint of organizational functioning. It probably has no consequences in terms of a theoretical model on organizational planning. However, from the viewpoint of the health professional with an ideology of helping people, one should worry about those 200 people. One percent may be unimportant in trying to understand the phenomena because it is low frequency, whereas 1% in terms of absolute numbers is important. I remember talking to some of the people who did some of the work at Buffalo Creek. I was interested in the fact that they seemed to get all worked up when they talked about a particular case or a particular child or a particular family. I can understand what is involved, however, if one is more interested in the theoretical issue of whether there were mental health consequences in Buffalo Creek, then the anecdotal case becomes unimportant, no matter how bizarre, unusual, or odd it was.

What is involved here is simply what one's end goal is. If treatment is one's end goal, then one does not dismiss 1%. It really does not matter if it was created by the disaster or not. There are people out there to treat. On the other hand, if the question is of knowledge and understanding, one would say there is no evidence of mental health

problems. One of the reasons we take this position is because it comes from a large body of disaster research.

I wish to mention a phenomenon because the issue is somewhat the same. It is the question about whether looting occurs in times of disaster or not. Study after study has shown that this is not a problem, at least not in American society. However, stories of looting are widespread. You go in and 80 to 90% of the population surveyed will indicate to you that they hear stories of looting. But, in terms of verified cases of looting, it is nonconsequential. According to very intensive studies, 3 or 4% of the people who indicate that they themselves have been looted in some way can narrow it down to the specific items that are missing. It becomes clearcut that there is no way they could know whether that item was taken away by the disaster itself or was actually stolen. On the other hand, the family who has lost something, will say the items were stolen.

This also causes a problem from the viewpoint of the security forces. There was no looting, but the belief is so widespread that even security organizations will deny their own evidence. I frequently give the anecdote involving a study we were conducting in Florida. We were not particularly focusing on looting, but it was a time when, as a matter of practice, we always had looting data. We were focusing on police department operations and we asked about reports of looting. The police chief said that they had not had a single case reported, but that the radio had reported some incidents of looting.

When Hurricane Alicia hit, I had sent in a field team that got there before the hurricane hit. They were in Houston and were supposed to work their way down to Galveston. There was no feedback from them. They had arrived the night before, and it was about noon when the NBC radio news came on and said that there had been a number of cases of looting in Galveston and 46 people had been arrested. About 15 minutes later, the phone rang and it was my field director, Jane Gray. I said, "Where are you calling from?" She said, "The Galveston EOC." I said, "You are supposed to be cut off from the world. You may be using the one telephone line to the rest of the world. Get off the line. The President might want to call!" I was partly joking. We talked about various things, and I said, "By the way, who had you been talking to down there?" She said, "Well, I just finished talking to the police chief." I had not said anything about the NBC broadcast. I said, "Well, what did you talk to him about?" She said, "The usual question about looting." "What did the police chief say?" He said, "We had four cases last night. Two clearly were not cases of looting, they were probably drunk and even our own police officers were in on that thing. The two others may or may not have been cases, but I would not really want to state it that way." I said, "But NBC radio said that there were just 34 people arrested for looting in Galveston last night." She said, "The Galveston police chief knows nothing about it."

My point is that reports about a phenomenon or widespread belief of a phenomenon is not always so. Another thing that might account for the differences has to do with different conceptions of disasters, especially if you use a very heterogeneous reference for the term disasters. I would like to read you something. "A fifth possibility for the difference in the two approaches may stem from differences in conceptions of disasters. This could be true in at least three different ways. For one, the individual trauma approach tends to include within the general category of disaster the full range of individual and collective stress situation. Thus, such diverse phenomena as the Holocaust, shipwrecks, air raids, famines, mass kidnapping, plane crashes, concentration camp situations and military combat services are all treated as the same generic phenomena into which are added natural and technological disasters."

The use of a heterogeneous class among other things allows for the picking of extreme and atypical cases. But also, it means that in a sense the larger your net, the more likely you are to surface something. In one sense, the more heterogeneous your reference, if you use everything, the more likely you are going to be able to find something. On the other hand, most of the other disaster researchers say that it is better that you use a narrow conception of disasters because it brings in the notion of the

therapeutic community. When you have a natural disaster, or more accurately, when you have a community disaster, you have the generation of a therapeutic community in the sense that all of the people have all undergone their disasters together.

They identify and reach out to one another. There is the creation of a support system. Many of the differences that existed within the community are temporarily set aside. They resurface again later, but right after a disaster happens, there is a brotherhood and sisterhood amongst everyone in most community type disasters. All sorts of conflicts, differences and cleavages that may exist are temporarily set aside. Some astounding differences were set aside in the days when segregation in this country was very extreme. This anecdote illustrates the point well. I was down south after a tornado in the early 1950's. I was there while they were still bringing people into a mass shelter. One of the things that struck me is that the black and the white families being evacuated were all mixed up together in this big auditorium early in the evening. It was very interesting in that by the next morning, all the blacks had ended up in one segment of the auditorium. Disaster researchers in India have also observed this. It is not supposed to exist, but the caste system is still very strong in certain parts of India. They said that at the time of the disaster it is remarkable that caste differences are ignored but that they tend to come back relatively quickly.

COL URSANO: Do you have any information or any thoughts on what it is that allows or prevents this cohesion from occurring.

DR. QUARANTELLI: Do you mean the dropping of the barriers?

COL URSANO: Yes, and then their reinstatement.

DR. QUARANTELLI: I would speculate along the following line. People ask me if there are differences in different societies in reactions to disasters. I would hypothesize the following: you have to posit different levels, the individual, the family, the organizational, the community and the national level. If you are talking about national level, Japanese society, for example, is very centralized in disasters, while American society is very decentralized, therefore, Japanese society is going to react differently than American society. This is because of the centralization of the governmental and political structure. Even though Japanese disaster planning is probably the best in the world, it cannot be taken and applied in the United States.

Cross-societal differences stand out more sharply at the highest level in terms of social differentiation. When you drop down more and get to the individual level, the human qualities come out. For example, the phenomenon of panic. It appears that human beings in almost all society show that the panic phenomenon does not exist. On the other hand, people seem to be frightened by the same sort of things. The unfamiliar frightens people more than the familiar. In all societies, it is very difficult to get family members to leave an area if they do not know the status of their other family members. The family ties are extremely strong, even given dramatic differences in family structure. One does not abandon other family members. At the individual level, there are people reacting as human beings. At the time of the disaster, there is almost recognition that this other person, whether of another caste, race, or class, is in the same boat as you are. One temporarily forgets these kind of differences and helps others. Maybe that is simply describing rather than giving you an explanation of what is involved.

COL URSANO: From the perspective you were presenting before about the impact on that phenomenon of the breakdown of the usual societal organizations in a community, if there is a disruption of the usual organizational pattern of the community, does that grouping together increase, decrease, or remain unchanged by that?

DR. QUARANTELLI: I think it increases. The best instance of this is search and rescue which has been fairly well studied. You probably all saw pictures of the Mexico City earthquake and you remember the pictures that came over American television with all these dog teams from all over the world pulling people out of the wreckage. At that time, I thought that was odd because the picture that was coming across showed that many people were being rescued by outsiders. It did not fit in with the standard principle that the overwhelming bulk of search and rescue is done by people around the debris and the wrecked homes. We are involved in an extensive study with some Mexican colleagues who did manage to obtain some data right after the earthquake occurred. Other people also studied the dog teams and everything else of that kind. What comes out is very clear cut. Eighty to ninety percent of the victims in the Mexico City earthquake were rescued in the first few hours by their friends, neighbors, and people who just happened to be there. They just went in and pulled people out. The organized effort pulled out a few Mexicans. Some of the Mexican organizations then got in and pulled a few other people out.

It is not clear exactly how many live bodies the dog teams actually found, but clearly it was a very low number. More important than that, the later rescuers probably ended up killing more people than they pulled out. The figures are unclear and any statistics in Mexico are shaky, but it seems clear that more than 100 people died in the more formal rescue effort afterwards. It also seems fairly clear that 100 people were not pulled out so they in fact lost more people by their later rescue effort.

My point is that Mexican, Japanese, Indian, and American societies all have different norms, values, and roles. When it comes to the matter of search and rescue, they all plunge in even when they are with strangers. Somebody told about an incident in Singapore in which a building collapsed on one of the main streets. A man went there with his formal team of rescuers. He said it was amazing how the passersby, that had been there after the building collapsed just dove in to help even though they were perfect strangers. These people just happened to be in the street. They heard the cries coming out from people underneath the debris. They were not doing a very efficient or effective job, but they were trying to get the people out. They did not simply sit around and gawk. They had no responsibility. They did not know who was in there.

On a cross societal basis in disasters, people act very proactive rather than simply passively waiting for something to happen. All sorts of normal social barriers fall which eventually return. In fact, new ones are added. At the time of the disaster, everybody loves everybody else. It is a little overstated, but nevertheless, it is true because all sorts of barriers are down. In the long run, the old conflicts and cleavages come back. In addition, the new differences that have emerged from the recovery period enter into the picture. The high morale which occurs during the immediate post-impact period does not last. Differences do emerge. In American society, some very subtle social class differences come out which tend to be played down in everyday behavior. They come out in very subtle ways such as which area gets rebuilt and if the downtown area gets rebuilt or not. There are all sorts of power struggles behind the scene.

The sixth possible explanation of the differences is that many of the individual trauma people work with what I would call a medical view of the phenomena. This refers to the notion that there is some objective reality out there that is responsible for the pathologies. Most of the social sponge people work with a social problem view of phenomena. They essentially argue that things are defined in a particular ways and social problems do not have any objective reality. A social problem is the interplay of different forces in a community. Something gets defined in a particular way as being a problem. It may not get defined earlier as being a problem, but it ultimately assumes this definition.

There are differences between these two notions. In one imagery, the notion is that something real is happening and therefore there are going to be consequences of it. The second imagery, however, is the idea that whether something happens or not is a

result of psychological or social forces that are at play. Therefore, it is almost a different conception of knowledge and reality. In one, there is a real world with real phenomena happening. In the other, it is a much more perceptual world in which what happens is the result of the different perceptions.

Judy Golec, who conducted the Teton Dam disaster research, argues against medical knowledge. She says that the assumptive framework on which the medical model rests leads to an interpretation which obscures the contradiction and essential features of the disaster experience and process of recovery. The medicalization of social phenomena has two basic shortcomings which obscure the important features of social event. One is the adoption of the medical metaphor to explain social conduct which psycholcgizes and depoliticizes social phenomena. By ignoring the social context and by focusing on the causal primacy of disaster, the medical metaphor leads to a misunderstanding about the nature of the post disaster problems which have important consequences for disaster victims. It also fails to recognize that the most efficacious solutions to some disaster problems may reside in changes in public policy as well as those interventions aimed at changing aspects of the social structure.

What she was talking about there was the Teton Dam disaster. She points out that over a three year period some people had what might be called psychological problems. She argues that what was involved here had to do with two issues. One was that this was Mormon country and if one was not in the Mormon "flow of events" then one did not get caught up in terms of the social support system. One did not have to be a Mormon, but if one was not, one did not get caught up in this.

The second issue involved compensation, particularly for the farmers. Essentially it was a political decision, fought at both the state and the federal levels, concerning how people were to be compensated. It could have gone the other way, but because it went one particular way, certain of the farmers who were rural inhabitants suffered in the long run from the disaster as a result of a political decision, not because the Teton Dam collapsed. It was this decision which could have easily gone the other way. This was the problem.

Her notion about depoliticizing social phenomena is that much of what happens in terms of the response period is a result of political decision and of political forces. Whether or not something is defined as a disaster, particularly a federally declared disaster, has much more to do with political considerations than with "the objective reality out there." There are, however, important consequences of this. For example, if it is not a federally declared disaster, the federal government cannot provide the crisis counselling programs. Furthermore, if it does not get declared a disaster, even at the state level, there are certain aids that cannot be provided to the disaster victims. That is one part of the social context that one has to take into account in terms of trying to understand a situation.

To conclude, I have tried to look at the differences of the two views in terms of these six possible differences. You might try to argue that these are possible explanations of the fundamental differences in the two approaches, but I do not believe that any of these six differences are the fundamental differences. My explanation essentially has to do with the sociology of knowledge approach.

COL URSANO: At this point let us hear if people have questions or comments.

CAPT BARTONE: One aspect of our research into the Gander crash and various affected groups involved looking very closely at the military unit of the battalion that lost the most soldiers. They lost about 200 soldiers, comprising about a third of their force. We followed them intensively over a six month period following the crash. Essentially, it is fair to say that we saw was a social sponge. The unit went through the mechanics of the reconstitution process and the replacements were absorbed very quickly. The social

fabric of the unit seemed to be restructured very effectively and quickly. We tried to understand what appeared to be normal recovery process for that group.

After six months, individuals and the unit were in pretty good shape, both psychologically and generally. They were ready to deploy if called upon. But there were casualties in our observations. There was a small percentage of individuals, possibly from 1% to 10% who did not seem to do very well. The classic case that comes to mind is the master sergeant survivor of the mission. [redacted] had returned on another flight. His blood pressure had gone way up and he had been drinking very heavily. He reported actively avoiding any reminders of the event and the memorial ceremonies. He did not seem to be in very good shape. There were a number of other soldiers in similar circumstances.

One could argue that those folks are only of interest to health care providers. They are of research interest to us because of the question of individual differences and the question of what accounts for individual differences. Is it social support or is it something else? Is it personality or possibly a view of this event as a challenge?

DR. QUARANTELLI: It might be something else.

CAPT BARTONE: What is it? I am disputing your point that those individuals are not interesting from a research perspective because it is only by studying those who do not do very well that we can understand the normal recovery process. This has policy implications and is an important one for the Army. Can the normal recovery process be speeded up?

DR. QUARANTELLI: What is involved here may be something else. About five years ago, people from NIMH once asked if I saw any phenomena where there might be severe mental health consequences. I said, "Yes, on an anecdotal level, I am beginning to get a sense that the scenario that you have not looked at might be the area you should look at." I explained that first responders, the police and fire people, have provided a great deal of anecdotal situations. They seem to have long run psychological problems. First responders have become very popular. Mitchell, at the University of Maryland, has done research on this.

I told Mary Larson that if there is a place where there are probably severe mental health consequences, it is among first responders. I ventured a few reasons why I thought so. This may have bearing in terms of the military situation, although I have not done studies and this is purely anecdotal and comes from observations and talking to people. The reason the police and firefighters have problems stems from two issues. One is that human beings respond very well to disasters generally but there is one kind of phenomenon they respond very poorly to, and that is handling dead or mangled bodies. In various disaster studies all over the world, mutilated bodies consistently devastate people. From a quantitative and qualitative point of view, a disaster with a large numbers of casualties is very disturbing to people. It seems that it deeply affects them psychologically. So one point is that we have a disaster where there are people involved and the worst kind of disaster is when you have mutilated children.

In fact, if you remember the Kansas City walkway collapse, there was a physician on television talking very confidently about how he was there and how he was doing all sorts of activities in the middle of the debris. Then he started talking about a boy. He said, "And then I suddenly decided I was going to have to cut off his leg, not because I am a great genius but because that was my experience." I sensed that he was going to break down crying. Sure enough, he began bawling on national television. My colleague asked me how I knew he was going to do that. On an anecdotal level, when you have mutilated, damaged bodies, and when children are involved, no one that I have ever seen handles that well."

One explanation regarding the Gander plane crash was that a great number of bodies were involved. Also, policemen and firemen seem to have a problem with their macho image. This is part of the subculture. They feel that they can handle anything. They get in these situations and they cannot handle it or they do their best with the bodies. People still die in front of them, even while they are pulling them out. In a sense, they have seen themselves as failing in this situation. First responders seem to have high potential of having severe mental health consequences, especially if you put this together with a lot of mutilated bodies. I cannot see too many people who are likely to handle this well, although it may be counterbalanced a little bit by the unit.

LTC INGRAHAM: But how do we reconcile that with the earlier statement that 90% of the recovery operations were done by first responders, people who were right there?

DR. QUARANTELLI: By first responders I mean the police and the firefighters. The first responders in a disaster area are usually thought of as these formal organizations.

LTC INGRAHAM: What about the people in the Singapore building or the other folks that are plowing through the wreckage?

DR. QUARANTELLI: I would not have an image in mind that that was my job. If I make it, fine. If I do not make it, that is the way it is. I am reading a study of fire departments, which has nothing to do with disasters, and the image they have and their sense of control they have over the situation is different from other individuals. They are put in a situation where they fail. I would not consider myself a failure and most of the people digging out other people do not consider themselves a failure if they do not manage to do something in search and rescue because that is not the image they have where they can do something. If they do something, fine.

Part of the problem here is in the area of first responder. By first responder, I do not mean first in the sense of the initial people. First responder refers to the emergency organizations. We are talking about police, fire, and some EMS people. That is the way the label is applied. In fact, what Mitchell has found in Baltimore, that a great number of these people have problems. I think it has to do with occupational culture and their self image. I would think that in the military there is some element of this among certain personnel.

LTC INGRAHAM: Yes, but what we find that the critical variables are those associated with volunteer status. If you are conscripted to participate in these kinds of operations there seems to be a greater probability of adverse reaction. Volunteers do better.

DR. QUARANTELLI: The conscripted ones do not see themselves as soldiers.

DR. KATZ: You mentioned how people identify in an immediate first response way. They identify and the barriers of differences seem to break down and then subsequently form again. They may even get increased. This is an important thing to consider. What are the social organizational variables that are likely to prolong this period of identification or to promote it?

DR. QUARANTELLI: In all communities and probably all organizations, and this has nothing to do with disasters, there are always varying amounts of differences, conflicts, and cleavages. In one sense there is the old notion that the best predictor of future behavior is past behavior. If you are going into a context where there is a lot of

conflict, it is going to surface afterwards. If you are in a context where there is relatively little conflict, it is in the post-disaster situation. In terms of the short run or the long run, sometimes things are done well and sometimes are done poorly. This feeds into it. If things are done well, then this is less of a source of problems. If things are done poorly, then this becomes a source of problems.

DR. KATZ: If there is a protocol for how to handle disasters, the protocol itself might actually increase the cohesiveness among the rescuers. I am thinking of the military in the sense that you cannot afford to have consistent recognition of differences because you have a job to do. I think it is important for us to consider what the social organizational aspects are that can increase this. I do not think it is just a given. This is what occurs later and it depends on just how many conflicts exist. We can say that there might be some differences and that we should look at them.

COL URSANO: What would you put in the category of good things to happen afterward versus bad? Empirically speaking, what about age recovery, etc?

DR. QUARANTELLI: We have to separate out what might be perceptually seen and what might be evaluated as efficiency and effectiveness in a different way, but let us leave that aside and just talk in more general terms.

It is clear that populations right after disasters expect, at least in American society, that officials who are in some responsible position are trying to do something. These symbolic visits of governors or presidents to disasters from an organizational point of view are actually very bad and they tie up personnel. But, from the symbolic point of view they are very good. The fact that the governor, the mayor, or the president comes conveys a general message and in that sense the politicians are guessing quite right. They should be out there because people expect them to be out there. These are purely symbolic gestures. At another level, most disaster planners and personnel are very unhappy with these VIP's. They tie up personnel, but it is very crucial because it looks like somebody is trying to do something.

The other thing is that people will put up with an awful lot at the time of a disaster. They do not expect things to be done like normal times in terms of speed and efficiency. On the other hand, they do expect things to happen. They have got to see some concrete steps, and again, it does not have to be anything dramatic. For example, a tornado has gone through a town and there is debris all over but after a week, that street should be cleared of debris so that people can get up and down.

Most important of all is the restoration of the situation to as normal as possible. By as normal as possible I mean that the stores that have closed should reopen and routines should be followed. People should be kept as close as possible to the familiar and the usual. The federal government has consistently made major mistakes. For example, in one case when a disaster hit an area, they put people in trailer camps. I think they finally learned their lesson. Researchers have insisted that those resources and net efforts be spent on letting people live in their wrecked homes. They will be much happier being with their wrecked neighbors than moving them to nice homes. In Wilkes-Barre, there were some bitter fights in the street where people were saying they did not want to go to the camp." The response was they could not be provided with certain services. The people still wanted to live in their homes.

The basic principle is that people prefer the usual and familiar. We should have learned our lesson from World War II. The British evacuated a great number of women and children from London. They thought they would get them out of the way and that would make everybody happy. At the height of the V-2 bombs coming into London, more people were going back into London than were able to get out. Many of the women and children were coming back. The British social scientists did studies on what was happening. One woman summed it up very beautifully by saying, "Well, if we are

going to die, if some of us are going to die, we all are going to die together, not me being up in Scotland and my husband back here in London."

These people were not acting irrationally, they were simply going back to the familiar and what they were accustomed to. They were with people that mattered to them, so it became a matter of restarting things as quickly as possible. That is why it is important to open the movie houses, the stores, etc., and to get some of the streets open. Debris clearance, which may seem very mundane, is something that tells people that somebody is doing something, and I can now go up and down my usual street.

Certain things are very difficult to deal with. I interviewed a woman in Arkansas after a tornado. Her home was wrecked but that was not what bothered her. What bothered her was that the trees in the street would never be the same again since they were all knocked down by the tornado. There was really no way to help her. She said, "I will never see those trees again." She was about 60 years old. Sometimes symbolic losses are much more devastating than material losses, especially when you hear people who talk about losing family mementos. Their home may be wrecked, but that was only a home, but if they have lost photographs that really breaks people up. There are certain things you can do, while there are others that I am not quite certain how one handles.

COL URSANO: Some of things you are indicating may proscribe against activity, particularly in the military setting where it may be even more important. Then you have the question of keeping things familiar. On the one side, the commander is prone to get in there and clean up the streets. On the other side, the commander is also prone to bring in the mobile homes and somehow to say, "Okay, let us switch everybody over here." It is a question of activity.

DR. QUARANTELLI: This occurs in the civilian sector and even the federal government. I just noticed that FEMA has decided that they are not going to use mobile homes any longer except under the most unusual circumstances. They are going to give people money to rebuild their houses. They are going to let people live in their homes or go to their friends and relatives. You do not set up communities. Buffalo Creek was a classic case in which they took close knit neighborhoods and put people in with strangers. Their children were going to school with strangers, the men were working with strangers, and the women were with strangers back in the trailer. Then they wondered why all sorts of things occurred that had never happened in those communities before. For example, juvenile delinquency was almost nonexistent in the Buffalo Creek area before. They then wondered why they had juvenile delinquency and vandalism in the trailer camps. They created it. There were a bunch of strangers living side by side.

The military may have some problems here, but the basic principle is restoration of the usual.

COL HOLLOWAY: You have addressed a problem that bothers me a little in the data and that is your utilization of arrest records. Arrest records are notoriously subject to social manipulation before, during, and after disasters. As I recall, studies of actual police behavior indicate that policemen who are reporting crime intervene only one out of nine times while actually observing a crime on the streets, and an arrest is made in cases where they intervene only one out of nineteen times. Given those kinds of background statistics, it would seem that arrest records are highly subject to another kind of change in social dynamic. How does one look at that in the context of disasters?

DR. QUARANTELLI: There are two ways. One is to find out what is being done and what is not being done. For example, the police may tell you that they will ignore all parking violations at this time.

COL HOLLOWAY: In watching the streets of New York, people commit crimes of theft. We are talking about theft. We are not talking about minor crimes. One in nine are attended to, while one in nineteen are arrested.

DR. KATZ: Do you think the looting behavior that was referred to might be of that same order?

DR. QUARANTELLI: No, in looking at the looting behavior, we not only used the arrest figures, but we also used the population surveys. We asked people if they themselves had been looted, and if so, what had been looted.

COL HOLLOWAY: I am in favor of raising the issue about social indicators. Social indicators themselves are multi-determined subjects, and they can be relatively insensitive to certain kinds of other profound changes.

DR. QUARANTELLI: Yes, that is true

COL HOLLOWAY: Studies in Illinois, in which independent measurements of actual crimes committed by teenagers were taken, demonstrated the crime rate of commission in the suburban communities was exactly the same as it was in urban communities. The difference was the arrest rate. Almost no arrests occurred in suburban communities. Arrest rates occurred in urban communities for exactly the same acts. Is it conceivable that in Buffalo Creek it was not that the boys suddenly became bad when they were put into these trailer camps, but that the police then visited the trailer camps?

DR. QUARANTELLI: Yes, it is conceivable. I did not do studies in Buffalo Creek, but in terms of what was described, it did appear that there was a change.

COL HOLLOWAY: You have already said that the changes are illusionary. Why accept that change rather than the other change?

DR. QUARANTELLI: You have asked me about a situation where everybody is in the study. In terms of some of the transcripts I have read of family reports of their own children or of the children of others, they seem to be reporting something different than the reports from the authorities. These were reports from the victims themselves who had been vandalized. When they lived in the old place, they had never been vandalized. We are not using the authority records there.

As a sociologist, I recognize that all records are organizationally processed which means that they are always dubious along certain lines, but one of the things that seems to show up during a crisis does give a certain credence to records. I picked this up in a civil disturbance when I was out in Watts during the ghetto rioting and we were doing a major study of the fire department. I was talking to some of the high fire department officials. In the dispatching room they said that they had noticed a very odd thing. Somebody had mentioned this to me earlier but I had not seen it. "We are getting all of these false alarm and fire calls in the Watts area but it is remarkable, in the last three days, calls coming in from the rest of the city have dropped dramatically." This comment was triggered by my question, "How do you maintain fire protection in the rest of Los Angeles?" They replied, "The calls have dropped dramatically. I said, "What do you think accounts for that?" They said, "Our guess is that people do not call us for things they otherwise would call us for. There is a cat in the tree. Nobody is going to call us down in the middle of a riot for a cat in a tree. We seem to be getting a lot less calls for minor fires. We do not seem to be having any waste paper basket fires. It is

inconceivable that they are just not occurring out there, but we think that people are handling them at the height of the emergency so the police have also reported the same thing in terms of number of calls. They reported that there seems to be a dropoff of certain kinds of reports, not including arrest figures."

During times of disaster if a community is not totally impacted, the citizenry at large do not do certain things that they would normally. They would have felt silly calling the fire department and saying the cat is in the tree. During normal times, they get many of those kinds of calls. What I am trying to indicate here is that one can look at certain records and without putting one's total fate in them, one can get a feel about the trends and particularly if one talks to the people who do the records. For example, the police we talked to always say, "Forget about the parking tickets, we are not ticketing people for those kinds of things at all." On the other hand, looting essentially involves a felony. The police pay more attention to those things. We matched the things we typically get the year before and the week before, and the figures almost invariably drop off at the time of a disaster.

COL HOLLOWAY: I want to emphasize that my concern is strengthened by your example. That concern involves understanding the data from Xenia which I have always utilized and find very valuable. In that data you demonstrate that there is a disaster and that there is a relative drop in the utilization of mental health facilities. It is conceivable that that is the same sort of phenomenon which occurs during a major disaster, and therefore, we do not strain our local resources. It does not make any difference if there is increased psychopathology. We do not do it because we are getting over a more important event. The question has nothing to do with the way in which the community is perceiving or accepting its load but rather the way it is utilizing its resources, exactly the example you gave for Los Angeles.

DR. QUARANTELLI: I remember talking with some of the people at the guidance clinic in Xenia. We talked to all of the agencies involved and we asked them if their normally scheduled patients came in. They said, "A number of them called up and said you are probably busy with other kinds of problems and therefore forget about us, we will come back later on." So there is no doubt that the demand is still there, but it is not being used, accounting for some of the drop in the figures.

I am not concerned about one set of figures because some of the figures do show increases. When you put 50 indicators together and 45 are all in one direction and only five are in the other direction or somebody else does a study wherein the same sort of things show up, one can attribute this to a variety of things. For example, during the Three Mile Island incident the traffic accidents seemed to have dropped off tremendously during the height of the emergency, but one could attribute that to a variety of different things.

COL HOLLOWAY: You cited the Rapid City disaster that showed an increase in alcohol consumption, is that not right?

DR. QUARANTELLI: It is not our study but I have the details here.

COL HOLLOWAY: It showed an increase in a number of social variables indicating that in other disasters some of these same things have shown increases.

DR. QUARANTELLI: It is a whole labyrinth. Another study conducted 18 months after the Rapid City flash flood found that there was no significant increase in the number of attempted or actual suicides including single car accidents that are often considered suicides, the rate of juvenile delinquency, the number of citations for driving while intoxicated, the number of automobile accidents, the rates of scarlet fever, strep

throat and hepatitis, the number of prescriptions written for tranquilizers, and the utilization of community mental health services. You are correct. There are several things that went in another direction.

COL HOLLOWAY: This pertains to that same group.

DR. QUARANTELLI: Yes, it concerns that same group.

COL HOLLOWAY: What does one do with a phenomena that is not a unidirectional set of changes but, in fact, multiple changes? A good example here is that the rate of hepatitis does not go up. Unless you measure anicteric hepatitis, then this is a good example of a medical condition in which you would not know if hepatitis changed at all. Hepatitis would not be a good measure for the overall instance of cases, unless it was a massive change.

DR. QUARANTELLI: This is a methodological pointer which also involves other areas where the data is on much shakier grounds. One of my major areas of interest is the area of collective behavior including crowd behavior and mass behavior. If you think statistics are hard to get in this area, the crowd area is even more difficult. My general feeling is that you simply do not worry about a particular indicator. If the overall picture is fairly consistent in drastically different kinds of situations, such as cross-culturally, then you begin to feel something is operative. One particular indicator does not convince me unless there is consistency and I feel that this must be what is essentially involved and that obviously is a judgment call. Most research involves judgment calls on most matters. All statistics, whether generated by organizations or by researchers, make assumptions which may or may not be warranted. You can always question any kind of statistics because they make certain assumptions. If you challenge those assumptions, you can say there is something wrong with this. However, if there is consistency in the general image I attend to that, particularly if there is not any consistent negative evidence, then that would bother me.

That is why I was making the allusion before about role conflict. Our group and others have done surveys. One can always say that people will cover up. Is it true that nobody has ever abandoned their work role? Forgetting about all of the more systematic studies which have attempted to quantify this, if you look at the more anecdotal evidence and if you look at the general studies which have not looked at this particular problem, there are no cases that show up. That gives strength to my view because of the somewhat dramatic events this kind of stuff would surface, yet one does not find a single case, though one cannot say that no such case has ever happened. A colleague friend of mine, Scanlon, claims he found a case in an Australian disaster. If it does not show up in other ways, I feel confident in saying that it is not something that is a practical problem. Theoretically, the proposition holds very well. I would be the last one to challenge organizations of creating their own data. You are right about police and criminal data where they usually get murder and aggravated assault. If there is consistency in the data then, unless they indicate that they drastically changed their operations, then why should one feel there is any difference? Other societies, like Japan, are less suspect because they have a much lower crime rate. The disaster situation appears to be the same there as in the U.S. It is dropping off. We have done certain collaborative studies with some Japanese colleagues and one of the reasons we did it was because we thought Japan and the United States were similar. Both are industrialized and urbanized societies, but the Japanese culture is rather different from American culture. The two countries are showing up remarkably similar along many lines in the disaster area, however, other differences become apparent. Japan, for example, is a very group oriented society. The notion of individual volunteers is rare on an everyday basis, so you do not get the emergence of volunteers like in American

society. However, we did a mass media study with them and we thought there would be some major differences. If you take away the names, you cannot tell whether you are talking about Japanese society or American society. In terms of radio or television and newspapers, you cannot tell the difference.

COL URSANO: Would you draw any distinctions based on the type of disaster, given your comments earlier about the potential number of bodies? What about when you remove the whole community, wipe out the community and then bring the community back, i.e., no people lost versus disruption of services.

DR. QUARANTELLI: The question is frequently asked when looking at the difference in natural and technological disasters. It is not a crucial difference. Disasters do differ, but they differ along other dimensions. I use an example which fits in beautifully with the issue of whether the disaster gives a forewarning or not. That is important. The magnitude of the impact of a disaster makes a difference. We do not really have a good typology of disasters, but the typology should not be "acts of God," and "acts of men and women." This typology would not get equal billing these days.

This is a meaningful distinction, however, we do need a typology of disaster in terms of forewarning, magnitude of impact, duration, and a variety of other things. A good typology does not exist in the literature. Most of the people are still struggling with the natural versus technological. The notion is that blame can be associated with technological as compared with God. Of course, we are blaming God in the God ones.

COL HOLLOWAY: There is a major flaw in that, but I agree with that line of reasoning. One of the major flaws is something you pointed out earlier and that is the minute the rescuers arrive, they create problems. It becomes a human disaster, so the only pure technological disaster is one in which there is some kind of technology without humans. You have certainly wiped out the disaster so it really is a problem in taxonomy.

DR. KATZ: Is there any distinction between disasters that can recur such as certain floods and those that can be predicted to recur?

DR. QUARANTELLI: Disaster researchers have talked about disaster subcultures. It does not follow that recurrency of disasters in areas necessarily generates disaster subcultures. The experience itself is not enough recurrence. In many areas that have recurrency of disasters, for example, tornadoes, then there is a tornado subculture that is usually agent specific. For example, tornado subcultures in Kansas, hurricane subcultures in some parts of the Gulf Coast and in Florida, and flood subcultures in certain places, like Cincinnati, Ohio.

This means that at both the individual and organizational level, there is the expectation that certain phenomena will reoccur. There is the expectation that certain kinds of behaviors will be undertaken. The disaster subculture may indicate that the disaster has to be of such a magnitude before it will even be defined as a disaster. We were conducting studies in Cincinnati, Ohio, and talking to Red Cross people. The water has always come up in Cincinnati during February and March. One of the Red Cross officials said that certain families, usually middle class families go to the country in the summer. These people evacuate in February because the flood waters are coming out. Businesses along the river have well-set procedures. They bring merchandise up to the second floor. Various organizations expect to do certain things. It is almost pre-planned. To that extent there is relatively little disruption of community life. When the team first came back, they said there was not a disaster there. I said, "I thought the waters went 14 feet over flood stage." They said, "It went 16 feet over flood stage, yet it was not a disaster."

So there is the phenomenon of the disaster subculture but it is not simply generated just by the experience. There are other things that are necessary to bring that about. We discovered certain areas where there was recurrency of the event, but no disaster subculture came into being, although that is one of the necessary, but not sufficient, conditions for it.

COL URSANO: What would be some of the other items?

DR. QUARANTELLI: The other items concern disaster planning where an emergency type organization takes the lead and says, "We are going to be faced with this on a regular basis and we want to organize ourselves for it." The Red Cross, or another emergency management agency, takes the position of future planning because they are going to go through this kind of thing again.

It is also related to how the mass media treats the event. If the mass media treats the event as an unique event, then that is one thing. But, if the mass media says that we have got our typical flood or at the chemical plant, there has been a leak again, people start getting an image of a consistent risk. That is a double-edged sword because you can ask the question whether that helps or not in terms of warnings, making people more sensitive to the potential disasters. Along another line it makes them feel more safe than they may otherwise be. For example, in terms of hurricane subculture, one of the problems is when you go into an area and some of the old timers say, "This is the seventeenth time, I have survived the previous seventeen, I am not going to leave." Well, the one that may be coming in this time may not come in the same way, so it is like the cry wolf syndrome which is sometimes associated with a disaster subculture.

In Crescent City, California, Tsunamis came in there. To some extent, a Tsunami subculture exists there. They got a number of false alarms prior to the Alaskan earthquakes and after the third false alarm, the people went down to the beach to watch the waves coming in at a high level. Unfortunately, because of the Alaskan earthquake, the technical system picked up the Tsunami quite well. The authorities in Crescent City were in a real dilemma. They knew that they had issued false warnings before. This time they hesitated and it cost them, sixteen people were killed and a number injured. This time the Tsunami really came in. They were probably right in that most people would have ignored the warning at that point and so a disaster subculture works both ways. If you put in the cry wolf syndrome on top of it, it can be a problem. Experience is the issue here. Do people learn from experience? Sometimes they can learn the wrong lesson. We survived sixteen times.

COL URSANO: One of the questions which I know Larry, Paul, and Kathy have been most interested in involves the question of the recovery of communities afterwards. Immediately, the question is what are you going to put into it? What constitutes a recovery? What constitutes a bad recovery, a good recovery, a functional recovery, or a nonfunctional recovery? What variables impact on recovery later?

DR. QUARANTELLI: When I said there is little done, I meant in relation to the emphasis on the emergency time period, the preparedness period. There have been some studies done and two or three general statements can be made regarding the findings. One is that disasters, not catastrophes, do not seem to change whatever existing trends are in the community. You sometimes get a certain type of data that you can see a little blip at the time of the disaster and then goes back to whatever the trend was - either up, down, steady, and things of that kind. We found that civil disturbances affected how police and fire departments reacted to civil disturbance. They learned little from most disasters. They change very little and communities are the same way.

On the other hand, sometimes drastic changes do occur. There were two cities where urban renewal was a major topic of interest. A tornado cut across Topeka,

Kansas for about eight or ten miles and in one sense provided instant urban renewal, and there was another city, where urban renewal was also an issue. In one of those cities, the tornado led to massive reworking of the central business district and a variety of other things, while in the other city it did not, though urban renewal was an issue. We questioned the difference between the two cities. The difference is that some group decided to take advantage of this opportunity. It is like a great deal in social life. Opportunities may come into being, conditions may be ripe, but unless there is some leadership, unless there is someone taking the ball and running with it, nothing is likely to happen.

For example, after a disaster hits a community, you get a lot of talk about better planning. We have done studies at one, three, and up to five years after a disaster. In almost all cases, there is very little change, but there have been some exceptions. Indianapolis was a classic case in which the Red Cross decided that they had to do something about this, so they made a major effort. They took the lead and they called all the other organizations together and said, "Here are the risks and hazards in this community. Why don't we plan for this?" They eventually brought about excellent disaster planning in the Indianapolis metropolitan area because somebody took the leadership, particularly when there are organizations that can become a political football. You need someone to run with the ball and the Red Cross is a good one because they are seen as neutral in the community.

CAPT BARTONE: Here is a concrete example from the Kimball experience. I would like to get your reaction to this. There were lots of formal, ritualized memorial services after the event extending up until the four month point and then they seemed to stop. Early on, these services seemed to serve important symbolic functions along the lines you were suggesting. Beyond a certain point in time, however, the feedback that we got from the various individuals with whom we spoke was that they were not helpful beyond roughly the two month point. The services did not seem to help and served as disturbing reminders of something that at that point would have been better left behind.

DR. QUARANTELLI: I agree with you on this. It shows up in research efforts. We learned through experience that if you go in right at the time of the disaster or right after it, you frequently get a great deal of cooperation. However, if you go back when people are trying to get back to normal, it is very difficult to get cooperation. There is a point in the middle when there is an attempt to restore. If a tornado hits a town on a Monday, we could go in there that Monday, Tuesday, Wednesday, Thursday and Friday and probably get excellent cooperation. We should not, however, go back after that weekend. The weekend is used as a symbolic point. By Monday people are trying to get back into a routine. It is much easier to operate in a ritualistic manner in the early stages. The rituals serve a purpose.

I once did a series papers with some colleagues on the handling of the dead. You were talking earlier about some matters about human behavior. This has not been well studied but there is some fascinating information here. For example, in all societies around the world mass burial is very strongly objected to. In certain places, including Italy and Iran, after the earthquakes the government attempted to impose mass burial resulting in semi-riots in the street. This is very unusual anti-social behavior.

I was at the Vihant Dam disaster in Italy talking to the Italian general in charge of the operations. The Italian military was expending a great deal of effort. Two thousand people had been killed in that dam disaster and the Italian military was spending a great deal of time and effort in finding the bodies. I asked the general, "Aren't you spending a great deal of time, effort and resources to dig out bodies that you are then going to bury again?" He replied, "We are under tremendous pressure to do so because the relatives keep coming around."

I thought about it and then later, in a different context, looked at it in more detail. We conducted intensive studies of people who handled bodies, including funeral directors and people who find dead bodies. Apparently it is true in all societies that there is a major effort made to transform bodies into people. For example, it is remarkable the time, effort and resources that are spent on identifying bodies. In the Italian dam disaster, some of the people involved said, "The remains we got here are not identifiable but now we are down to the last handful so we can finally tell this family, yes, that is so-and-so, these are the remains of your relative." They go off, not happy, but they go off with it. It is an effort to identify and personalize the phenomenon. The dead are not let go of until they are identified.

In some coal mine disasters, this has gone on for years. The body has been buried in the mine, and seven years later, they open up the mine and drag the remains out to the extent they are still there, and spend a great deal of time, effort and resources, identifying the bodies and giving them back to relatives. I remember Dover Air Force Base's involvement after Jonestown. This was not a disaster, but a suicide by poisoning, and yet they spent a great deal of time and effort identifying all of the bodies.

There seems to be something that strikes some very fundamental social psychological idea that the living do not want to simply handle the dead as bodies. They want to identify them. We have found that in terms of handling bodies, and this cuts across all societies not because of planning but because there is a very elaborate almost ritual worked out, that the bodies are handled very carefully. When they are put in trucks, they are carefully laid out in the back. They are not just dumped there, but they are covered and there is tremendous effort to get the right pieces together. Sometimes bodies have been so mutilated and they are trying to find the arm or the leg and put it together. There is something operative occurring. I am not quite certain what it is, but there is for the people involved, something that they cannot explain, but it is just natural to do. This is an explanation on the common sense level, not a theoretical explanation.

DR. KATZ: This is the individualistic tradition of the Judeo-Christian society.

DR. QUARANTELLI: No, it shows up in other societies, too.

DR. KATZ: Cross-culturally?

DR. QUARANTELLI: Yes, for example, in Iran there was an earthquake that we studied in 1965 or 1967. There are differences in, for example, the Mexico City explosion in November of 1984. One of the reasons we wanted to study it was because it involved mass burial. I did not go myself, but our team went and came back and reported on the mass burial that took place, saying that there were no problems. Jane Gray of the field team came up with an explanation based on what the people told her. Whether it is valid or not I do not know. She said that all of the people who were killed were basically rural migrants from Mexico City of the lower working class. The government and a number of organizations which were operative there did not pay much attention to these people. Second, they are used to being ordered around by the military, so when the explosion occurred, the bodies were literally pulverized in the immediate area. It was only on an eight block area so in many cases there was not much left there. There were no survivors in the area so if the explanation of the Red Cross and some of the other people involved was that had this happened in a middle class neighborhood, the government would not have engaged in a mass burial. They would have objected. These peasants, however, were used to being shoved around by the government. Jane said that there were probably other factors, so sometimes mass burial does occur.

DR. KATZ: I think the rule is that you identify what the people are. Enemies are not considered to be real people and they are always mixed in.

COL HOLLOWAY: The Japanese in World War II had interesting burial habits since there were two possible outcomes to being a Japanese soldier. You could die or you could return victorious. As someone has noted, they did not return victorious and as a result, a lot of them died. Perhaps one of the most striking examples is the Burman army which no one anticipated would come back. The way the continuity of this world and that world was obtained was around this issue and that demonstrates another culture managing the problem of bodies. Each person left behind hair that was cremated at the time they died because their bodies were never recovered. So there was a pre-arranged set of rituals within the Shinto that allowed a continuity of this world and the other world.

In Southeast Asia, a standard procedure was when the Pathet Lao in the area where I was working killed people, they would go into a village and kill people, and they would mutilate the body. Normally it would be a teacher and normally their heart would be cut out. The heart would be laid beside their body or cut to pieces beside their body and that would now make a spirit and who would live in that village who would be disturbing that village. One could then only operate not by burial but by the management of the spirits which was another example of burial not working in a really different culture. That was a Lao-Thai culture.

The same thing was true in Vietnam where spirits were already operated on by a different basis when you killed. If one wanted to carry out terrorist activities then, what you did to the body was absolutely critical to the overall process of inducing terror. Both sides explicitly carried out ways of recovering, mutilating or destroying bodies because of that action. As far as both sides were concerned, this was simply a way of waging war. Waging war does not express good intent toward the other. We take that as the first example. This was a way of making war upon the various societal assumptions that the other side was using. So these are a very complex set of relationships in which the capacity to discuss what this world is and the continuity of this world with another kind of life is an absolutely critical issue.

DR. QUARANTELLI: This handling of the dead seems to be a very fascinating thing. It obviously deals with something fundamental. It is mind over matter. In the disaster area there are only about five systematic studies on this. We know very little about it but I personally found that, being ghoulish, this was simply an interesting phenomenon.

COL HOLLOWAY: Did you publish that paper?

DR. QUARANTELLI: Yes, there are two papers published.

COL HOLLOWAY: A part of my paper is on that particular issue.

DR. QUARANTELLI: Yes, I was looking for that in the literature. You mentioned the Japanese; there are some fascinating articles about the American entry into Manilla after they reconquered it. The Japanese fought, block by block, and when it was over they sent the American military teams in to dig out the corpses. They pointed out incredible problems because the people did not handle dead bodies very well. They could not work the teams for a long period of time. People would simply collapse, not from physical exhaustion, but from psychological stress. This account is in Military Medicine.

COL HOLLOWAY: The anthropological sources hint about this. In Mary Douglas' work, she discusses the overall problem of our continuity of how we relate to one another, based in part on our avoiding the assumptions that we can be turned wrong side out. Our external boundaries will remain external boundaries and when you start dealing with boundaries, you literally deal with people who are turned wrong side out. Certain assumptions you make about your own integrity and potential integrity are reversed. The same thing happens when one takes care of burn people. Severely burned people, who are literally fried, have their externals exposed. Another area where you are almost in the body is if the person is still alive. These are very difficult circumstances for us neuropsychologically.

DR. QUARANTELLI: The whole burn area is one where we may have a major disaster in American society because forgetting about the psychological aspect, the burn handling capacity of American hospitals is very limited. One major nightclub fire or one major hotel fire would push it to its limits.

COL URSANO: The Jonestown event was looked at somewhat by David Jones in Texas. He did a follow up of those people who handled the bodies. The most interesting finding being that those who had the biggest problem were blacks. This is what you might expect in terms of the identification with the bodies. We were very interested in the events up at Dover and had many observations about it. One of the strongest ones supports your picture of leaving there and thinking why are we spending so much energy in identifying the individual bodies, a process which continued for several months after the events and incurred enormous expenditures of resources.

DR. QUARANTELLI: Yes, we studied recoveries of the bodies in the Rapid City flood and the Big Thompson flash flood. I did not do any of those field interviews myself, but we interviewed the people who came back. We tried to follow the process from the search and rescue effort, to finding the bodies, to finding out who the body was then turned over to. We were trying to find out what happened at each stage. In a sense, we followed the body along. The thing that came out from our field researchers was that these people were spending a great deal of time, effort and resources on this and they are being very careful. It was the consistency of the reports that was striking. One of our researchers talked about a ritual of death of how the bodies were actually handled and carried. The interesting part about it was in two cases there had not been any disaster planning for the handlir g of bodies. This was something that informally or spontaneously emerged and in the two situations, they were the same. It would be certain that in American society, they had not learned from one another, but you could again interchange the accounts of the care and the various kinds of things. They did, and I remember the notion of getting all the pieces of the bodies together. This seemed important to do and was followed by bringing in the relatives.

COL URSANO: There were very elaborate plans at Dover for identifying the different pieces. Those who recovered the bodies and those in the mortuary also made the same comment about that. If this crash had involved women or children, how much more difficult would it have been for them?

DR. QUARANTELLI: The worst kind of disaster would involve mutilated children. I would predict that most of the people working in that situation would have psychological problems. It devastates people to handle children. The one small plane crash out in Colorado in the 1950's included body handling. There were about 20 bodies including about six or seven small children. In the interviews, they were talking about how they handled the bodies. When they start talking about the children, they would

simply break down and were unable to talk, just like the doctor I mentioned in the Hyatt walkway disaster.

COL HOLLOWAY: Part of your thoughts about abnormal behavior is striking. I once triaged 14 children after 19 children set off a land mine. We did not see five of them because they were dead. We took care of the other 14 in the emergency room, all in various stages of being blown to pieces. I was doing primary triage in the front of the emergency room and I was struck by how businesslike it was. Until we got through it, we hardly dealt with it. It was striking. The Korean children were all very quiet and were not crying. Their parents were around them sobbing and doing various things. We were triaging them as to who would be operated on first, second, and third. We had only three operating rooms operating so obviously everybody could not be first. In that circumstance, the question was of maintaining that boundary. We just got those kids operated on and at the time I remember looking into a kid's joint and into his abdomen at the same time. Both were exposed and I was thinking that normally this would make me sick. I then continued triaging him.

DR. KATZ: But the ritual protects you.

COL HOLLOWAY: That is right. I was a triage officer. I was doing my triage job. I was interacting with a surgeon saying I wanted him out of here right now, and he went on operating.

DR QUARANTELLI: This is an example of playing your role. This is the point that people do not abandon those roles.

COL HOLLOWAY: That is right.

DR. QUARANTELLI: This is more true the more responsible one feels. There is a good account, and you may have read it, on one of the few physicians who survived Hiroshima. He was in the hospital during the bombing. Of course, he did not know what happened to his family or anything else of that kind. He wrote in a diary and then later wrote a book which has been translated into English. He worked in the hospital for three days without stopping. He talks about how obviously some tremendous catastrophe had occurred. He did not know anything about his family, friends, or relatives, but he did not leave because people were coming in and he had to deal with them. It was three days before he even began to explore the situation because he felt he could not leave. An anecdotal account, but I think a true account.

COL URSANO: I want to thank you for coming and sharing your wealth of information with us, and for putting it together so well. Thank you.

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RISK PERCEPTION

Mary Douglas, Ph.D.

24 April 1987

COL URSANO: We are very pleased to have with us Dr. Mary Douglas. Dr. Douglas is originally from London and University College. She did her fieldwork in the Congo and has most recently spent three years at Princeton. She has recently published a book receiving quite excellent reviews which focused attention on her work. Her first work was entitled Purity and Danger. She continues her work in areas of anthropology and the relationship of how cultures and communities assess, value, and view risk and fears associated with their communities and cultures. We look forward to her comments.

DR. DOUGLAS: Thank you very much and I thank Dr. Ursano very much for this opportunity. I appreciate this chance to talk seriously about these fields which interest me most. I also am aware of the difficulty in spanning disciplines. The first thing I should say is that my fieldwork in the Belgian Congo is not just my fieldwork, but my whole training. They need to be noticed particularly. Of all the dangers that surround people living in a tropical area, and all the kinds of illnesses that the people are prone to, they focus on certain ones which are not necessarily the most frequent. It is hard for me to say which were, but I will present some examples.

The people had three main areas of concern. First, they were very concerned about being struck by lightning. There are tropical storms near the equator and people do get struck by lightning. Second, they are very concerned about childbirth, including all the reproductive disorders of pregnancy, barrenness, and sterility. Thirdly, they are very concerned with coughing and with pulmonary complaints. You heard very little about fevers, leprosy, or skin diseases. Most of the time, all of our rituals and preventive medicine seemed to be particularly dedicated towards these latter areas. What was very clear was that the native's three areas of concern were selected out from the other concerns and noted with moral implications such that the apparatus of blaming and exoneration were triggered when anybody went down with those troubles. I was confident that the social selectivity of particular dangers and the ability to use those dangers in situations to exert social pressure on individuals was related. For example, if a woman committed adultery or even if she had not, any troubles in childbirth, which nearly always occurred, were immediately associated with lack of fidelity on her part as well as on her husband's part. The natives' were using the hardness of childbirth to reconstitute the boundaries around the nuclear family or the polygynous family. In the latter case, a co-wife would say, "My children are ill, my baby is about to die because my co-wife has been running around the village, and you, my husband, should know this and stop her at once." Incest is assumed to be the cause of most of the skin diseases. This belief is very widespread throughout the continent.

Lightning was not a common disaster, but it was a real one. It was attributed to the malignancy of sorcerers. In order to understand this selection of dangers, you have to get into the whole social structure and see where the weak points are in the authority system, and in the system of achieving each other's ends. When I first wrote Purity and Danger, more than 20 years ago, the book seemed to be a description of primitive

taboos that did not apply to ourselves. That bothered me because part of the study was to make their rules intelligible and more rational.

Later, I went to New York and became a member of the Russell Sage Foundation. Aaron Wildavsky, the President of the Foundation, said, "Is all you have done on risk pertain to the tribe or does it also apply to us? Have you got nothing to say to improve on Daniel Bell and others who are saying that you are young and very hostile to dangers from technology, but that you must be more alert to the causes of this being a cultural change? You must also explain the cultural change for which you have given no explanation. If you are an anthropologist, you must have an explanation." I replied that I did have a cultural explanation. I am not an American and therefore, I do not understand the politics.

Later, he wanted me to join him in writing a book about risks. That meant that I had to reconsider the background of where these changes in the cultural attitude come from. That is what I want to give you, that is my self-introduction and explanation. I hope to make less of a jump from your very specialized interest to my very specialized interests.

One way of distinguishing between anthropology and psychology is to say that anthropologists are more interested in interpersonal, activity and in treating the cognizer, the person who is doing the perception, as the socialized being. Psychologists, however, are trying to focus on the individual cognizer and it is largely intrapersonal except when you do social psychology. Inputs and outputs to the system of cognition that psychologists look at are inside the person. I was particularly struck by this after reading the papers that Dr. Ursano sent me about chemical warfare and the responses both of the troops and of the citizens, along with the victims of the attackers to different kinds of weapons.

I read this with horror and interest and saw that one of the elements that you highlight in the papers is surprise, the feeling of helplessness under a new form of attack. The surprise gives way to the reality creating a conflict of objectives. A soldier who has been trained to be efficient may give up protection if protection conflicts with efficiency. For example, he may tear away the eye shield in order to see better what he is doing. There is also the horror of seeing victims mutilated and defaced. These I would call an approach to individual responses.

If we try to get beyond the individual responses, and beyond the kind of old sociological law which says some do and some do not, you have to get into the sociology of it. The issues of what kind of social order you expect, whether or not it is especially prevalent, and where is rumor least effective and uncontrolled in this conflict, are the tasks at hand.

It will be a long trajectory before we get back, because when Aaron Wildavsky asked me about risk, I set out to study the literature on the subject. My most recent book is in fact a literature survey. It is not a literature survey of the work on risk perception. It is a literature survey of the work on social factors on risk perception, of which there is practically no consistent theorizing about the social factors on that subject. I found I was making a literature survey of a hole in the ground, that I was just finding small pieces of information. The work on risk acceptability or risk perception did not attend to the social variables. This is partly because of the domination of the psychometric approach which rules out social factors.

The subject of risk perception has been studied for nearly 20 years. Nineteen-eighty-nine will mark 20 years since Chauncey Stall wrote in 1969 about risk acceptability. His theory stated that if the public would act rationally like engineers do, they would take into account the normal background exposure to risks. They would separate the risks voluntarily, such as horse riding, skiing, and jogging, etc. and then they would not be so afraid. Stall's ideas were considered as if fear was something from beside oneself and as if the rationality were something that identified the individual beside himself.

I do not think that I am underestimating the results of this research if I summarize it under four headings. Human beings have such a strong sense of subject and immunity that the price, particularly for high frequency accidents, has a great deal of familiarity. Due to this, they discard information about risks in the home, which are very high frequency, and on the road, which "happen to other people." Secondly, there is a narrow perception of the dangers attendant on risk which are voluntarily assumed, such as horse riding which is very accident prone, and skiing. Thirdly, there are inadequate precautions taken against risk when insurance has been bought or if it is assumed that there is the equivalent of assurance in the way of a bail out, as in the case of flood protection insurance and quake disasters.

Lastly, very little attention is paid to low frequency risks. This comes out of Herbert Simon's idea of bounded rationality which attempts to improve on the economic model of the individual, rational being. He states that it is not rational on our part to assume that the individual can do all of these complicated calculations or carry all this information in their head. A rational being bounds off the area of concern and creates thresholds within which decisions can be taken. Psychologists and economists working on this idea of rationality have inverted the judgment of value. They have also assumed the loss of rationality by bounding the area of concern as if you should still be keeping your eyes focused on all the dangerous possibilities which people most manifestly do not. Most people would assume that it is highly rational to be selective in attention.

I would sum up the results of this empirical research by saying that the human individual is not as adverse to risk as the theory of cognition drawn from economics would suppose that he is or she is. Humans are risk-takers and you might think they would want to survive in many situations if they have not got ways of overlooking the risks attendant on their decisions. Unfortunately, the bias of the psychological tradition that I am referring to puts this risk-taking down to a near-rational interference with cognitive faculties, overlooking what ought not to be overlooked.

Secondly, it hopes to cure this irrational interference by education, which I think is a faulty conclusion to this research. The wrong diagnosis points to the wrong solution. Consequently, we have to read a huge amount of literature of reproach against education for not fostering the hopes that are being placed in post campaigns, educational films, and mass rallies warning people of what the dangers are. The big surprise for the theory and practice starting point was the interest of the general public in very high consequence but very low frequency risks for nuclear and toxic wastes, and fears from low level radiation.

An interest was developed in the 1960's and 1970's in the risks which the research shows are not characteristic of our behavior as individuals. Suddenly, we are discovered to be risk taking animals. Tests applied to our personal life expose us as risk taking. We are also suddenly shown to be extremely risk adverse to certain things. Both reactions, the risk taking and the risk hating, are quite out of line with the psychologists' results and the risk analysts' estimates of what is rational and ought to be rational behavior.

Something is wrong with the model of the individual cognizer, with the individual rational agent. I think what is wrong with it is the result of the desire for objective replicable testing. You are probably familiar with R. Frederick Bartlett who wrote on memory and perception. In the 1920's, 1930's, and 1940's, in Cambridge, England, he embarked on a career of testing perception and showing the individual organizing input into perceptions. His object when he started out was to try to discover the social conventions that guided perception, but he created methods which would rule out the possibility of ever finding the social conventions. In other words, he separated the individual subject under test conditions from his own socially varied background.

There is a time now for a new model of cognition, a more fundamental attack on the problem than just sharpening and tidying up. This needs to be rethought. In doing so, I am impressed with the relationship between disciplines, and how they reverse themselves over time. The work of Lola Lopez, a psychologist in Wisconsin who is studying

the basis of the economic models in psychology in the 19th century, discusses assumptions about risk perception. The economists seem to have provided the psychologists with a sort of borrowing. This now seems to have turned around. To some extent the psychologists are now borrowing from the economists their model of the individual rational agent. This having probably occurred by a lack of accord to a fundamental rethinking.

The economists are certainly reacting to the model of the isolated culture-free individual who is motivated only by self-regarding preferences. This individual in economics is motivated. This individual has been designed to explain the operation of the buyers and sellers in the market. The model taken away from the market context with consideration of the individual in isolation goes to pieces. This is because the individual is meaningless except in some context of interactions. If the psychologists are using the model that is popular in economics but not using the market structure, they have to insert another kind of social structure in that type of system.

When the economists worry about the limitations of their theory, altruism or any other regarding motives, and they attempt an additive approach, they try to add quantities to the individuals, and add commitment, as well as self-regarding interests. There is no use adding things to your model of the individual if you are not, at the same time, working on your model of the interactions your individual is supposed to be having with others.

The other regarding contexts are political, social, and moral. I hope that the proposal that I am making to the economists will also be helpful to the psychologists. It is not a sudden move for me. In 1970, I wrote a book called Natural Symbols in which I tried to explain the differences in primitive religions. A word or two here might help you to see where I am coming from and then follow where I am going. As an anthropologist in central Africa, I have been working to understand people who are obsessed by the fear that their neighbor was attacking them by secret means through witchcraft or sorcery. My colleagues working on the west coast of Africa, where there were great kingdoms and chieftains, were talking continuously about ancestor worship as a great moral regulator. Ancestor worship did not work in our area. A third type which we now recognize as being more evident in pre-colonial times because the colonial system stopped it, is a kind of a heroic culture in which the universe is full of magical powers. It is only the most moral and strong person, the boldest and cleverest, that can grab these paths for themselves.

Those are the three totally different kinds of cosmologies which are clearly being operated in three totally different kinds of social systems. Only one of them could be borrowed or used essentially in the other kinds of social system. The challenge that I have seen as necessary for cultural anthropology is to try to get a statement of the relation between the cosmology and the society such that it can operate or does operate with one kind of fear drawn from another kind of fear where the focus is always upon fear rather than upon benefit. The practical research reasons are of three kinds. I am selling you a typology of three kinds. It works to explain differences in religion, it works to explain political differences, and it works to explain risk. I will now try to justify it, or at least to get you sufficiently interested in this as a field of inquiry that you need to be in so that you can improve on it and make it right for yourselves.

We have to rewrite the individual now with other regarding qualities. The appropriate other regarding qualities we will call accountability. The human individual, since he is interacting with others, expects himself to be held accountable. This individual also passes praise and blame onto the accountability performance of others. That is the first rewrite of the individual class' intelligence and self-interest.

There are four assumptions. The first one is that any kind of connective action that is achieved, any kind of solidarity that gets built up to surprise you, is a very difficult, otiose form of order. This form of order is more amazing than any kind of disorder,

such that a flux would be more normal order, and stability would be easily explained. That social bondage is fragile is the first assumption.

The second one is that rational individuals can scrutinize their social arrangements publicly. They talk to each other about them. They monitor one another and debate about how we should live together, what our relationships are like, what sort of relationships should be public, how long will they last, how long should they last, and how extensive they are.

The third assumption is that there is only a limited number of social forms. This is crucial for the heuristic device to do the analysis. You must make this assumption, otherwise, you are caught by the humanist who does not want you to do any analysis but who says that human interaction may very well be variable. So is nature, but if you want to do some analysis, you also have to ask yourself what the first kind of major headings are that could be used to start with to begin the explanation and theorizing. By viable, I mean not just referring to the ability of that social form to resist flood, earthquake, and pestilence, etc. which can destroy any kind of social life, but particular dangers arising out of the culture. If there is a collapse of the normative debates, because of the way it is being set up, then that kind of culture will not be culturally viable. I am looking and listening for people monitoring each other in a way that will produce a sufficiently consistent and stable form of organization, given other conditions. I am looking for the pressures they are putting on each other for consistency. This is what you hear at any town meeting, any tennis club, any parent-teachers association, from anybody who gets up and says it is being done wrong. Individuals have got to be not only consistent with what they said yesterday, and with what they are saying today, but also with what they are saying and doing consistent with the group. We want to know what the group accepts as feasible or not feasible. This is the normative debate which involves social interactions and which requires consistency at several different levels. I believe that there are only three in that I have already dealt with flux and change as more normal than stability.

Now I am ready to go for my typology of cultural forms. Under those three assumptions, I will put up this slide which all of us use. There are about six units breaking on this kind of approach to cultural analysis and this is our school. The horizontal axis is an indication of their encouraging type of measure amounting to a series of group associations. Much of a person's life is involved in a strongly bonded group. From the interior, we are assuming that they are not going to count the kind of groupings that are there. It is for persons in very many groups. They were not exactly in what was the pressure point. If a person has put his whole life into a commune or a monastery, then he is absolutely held by the group. It is a very important dimension. The other one is concerned with regulation. An individual wishes to converse. Negotiation is submitted to the individual that will place the restraints on the individual for choosing and for options.

As results of those two dimensions, we have four extreme positions which at the top right is the hierarchy and at the bottom right is the situation of a very strong group. This is a group which is clearly bounded but has not got, by definition, clear discriminated roles between members. The bottom left is the individual who is in an environment of other individuals all negotiating everything with the other. The top left are those people who are in outside groups, but are somehow constrained. These groups are constrained either voluntarily, or are more likely constrained by the part that society has made up. The open network is the model of the market system. It is also a model of any kind of compensatory, what we call a big man system. This is any kind of individualistic competitive system with a lot in common in the cosmology, whether it is to do it through the market and trading, or whether to do it through fighting and fiscal competition, it shows up there. I really only have three types. A fourth type is one which is constrained by its being excluded from the group or being pushed out of the proper market interaction by the efforts of the market itself. I will talk about those four types, two

types really. The family life would be quite different in each of these. I started out with political symbols following the work of Dr. Berstein on families and education. At this point, when I am talking about risks, I will try to give you a general jump.

QUESTION: There are two dimensions you had up there. What are the other directions?

DR. DOUGLAS: The upright dimension we call grid. I wish I could think of a better word, but we simply call it grid. It is the dimension of other constraints, the dimension of control, or the way to control. The group is not completely independent because we would be the form of control. Most of the work that I have been doing has been the exploration of the properties of this diagram and answering questions about how it happens. It fits well to kinds of social organizations and kinds of culture belonging to them.

I was struck with the bottom right, which is peer group, based on bonding insiders against outsiders. That is the group boundary. The second one, the base of the market at the bottom left, is the exchange, the bonding of individuals with each other for individual transactions. The third one at the top right, is up-down, dive-up hierarchical bonding. My ultimate would be the inclusion of exchange and hierarchy. These are incompatible or quite distinctive logical operations so that an organization built on any one of these types is unique, unable to use justifications in the other types. This is important because so much rhetoric goes over the edges of all social types. We are picking on the cultural rhetoric that only they would produce in one type or another. Each type is legitimated on a different logical base.

Now I have to introduce another point. If I was looking for legitimation which I look at from the cultural side of the type of society, I would be naive if I thought consistency of the logic was enough to hold a system stable. I am not really convinced of the instability of social types. Consequently, in each case, I look for other self-sustaining chains of events that are unintentionally set off or intentionally help to sustain such a system. Thus, I am looking for functions in the system, a reason for calling us in the rhetoric.

I first start with the bottom right. It is pointed on the social problems.. It is pointed on the problem of a social group that wants to do something together but at which the section is too easy. Any member can get away and it is in the individual's best interest not to stay if any kind of impositions or burdens are put upon him by the others. The threat of defection covers this person's model. The problem for everybody is how to persuade the others to stay in. One of the solutions which is very common in religious communities is to make them sign a contract of community relations. Once they have done that, they have stopped the exit because the exit costs are high. Once a community does that, a religious community that makes individuals sign over all their possessions and get no pay for their work, then they generally solve all their other organizational problems by organizing a hierarchy. Social effects are not running in this section at all because they have taken that solution to the problem of defectors. They move up into a hierarchy.

The second solution is that you might sign a contract of all your goods to the community if you cannot answer truthfully to yourself how long you need to stay there. If you really need to stay there forever, you might do it. For lots of reasons, individuals band together and do not particularly intend to stay there forever. The other solution would be to institute trade. Then that community would move out of that corner of the diagram and move towards the market in the bottom left. It is the price; trade is the necessary thing. They have to accommodate that green tree life to the continual certain defection of individual members which will frustrate their techs and codes alike. Then, only certain options are open to them.

The charges that they have to answer are charges of unfairness. Anybody who threatens to go his own way, because so and so is taking the advantage or running to please himself, is unfair and would go out with a fair deal. The solution that is already gotten for that one is to demonstrate fairness by creating an equality in which we are all equal. Once you create that mood, you set yourself down and apart. That action can stabilize a community, while at the same time, this community is having great difficulties anyway.

The problems which that community runs into from that road are tremendous. Consequently, top psychologists and the individuals of that community are terribly unshielded from envy. They are exposed because there are no reasons for those separations among them. The community also exposes itself to weak leadership. It cannot have strong leadership because it cannot impose authority. It has to accept weak leadership and decisions. The further adaptation of the community to that is to accuse one another. You cannot punish one another if you have not got the authority to define the faults and crimes or to agree upon them. They have to live with ambiguity, but they do find themselves able to band together to accuse one another of betrayal. They also solve their organizational problems which are such dependers by expulsions and beatings. This one, which is the one that interested me before, because it is least studied for obvious reasons, is the central African model of the witchcraft accusing the witch. The description fits it and the analysis. The result of this debate going on inside this community concerns the question of who is a true hearted insider? Who is really committed? Who is having dealings with the outside? Who is trying to defect? The trouble is the definition of the insiders. This tends to be a religious form to get to reelect the good, the saved inside. The outsiders go into this evil which further helps to draw the boundary between the insiders and the outsiders. It also helps to make the threat of defection more culpable than it was before because who would want to leave the good here in order to join the evil outside? -- There must be a rock in the heart, not in the head.

That one form has a body completely different from the next one because it talks about the exchange type, the economic form of the religious. There they find a different problem, not the problem of defectors, but the problem of how we can explain the diversity of resources, and how we can allow ourselves to exchange. This exchange does not happen by itself because we have a lot of guarantees and trust. The market does not tend to be a self-fulfilling and self-sustaining system. It does indeed look forward to that.

One question involves how to keep a market from degenerating into a monopoly once a successful trader has a logic and a family. That is the normative debate that sustains market theory. The people had to pool themselves and protect private property, access to the market, and guarantees for contract. They also had to create trust for credit. This system is founded on the contradiction just as the other debate is founded on ambiguity. Of all of the differences of debating, this one is founded on the total contradiction between the principle of private property and the principle of free access to the market. The property right gives certain trades and bondages which in effect exclude any undue construction or constructive tendencies in the market. This comes from the fact that it generates whole classes of derelicts, people who are not able to trade.

This system is quite untroubled by the trips of free riders. It is a regime of private property. It is not at all troubled by defectors unless they are absconding with the other people who have not paid their debts in which case the debate has got rules for handling that. It does not work on any kind of exclusiveness for maintaining this system. On the contrary, we have watched this plan and feel it is as correct as possible. It does need some kind of reinforcement for the basic self to be protected.

It would never last against the accumulated wealth of a successful trader unless it has redistributed institutions. That is why you get the display of conspicuous con-

sumption which everyone thought was characteristic of model industrial society. It is not especially characteristic of us It is a psychological characteristic, a response to the public at large. It is a way of redistributing. It maintains open access. You find it in the very experienced economies. They are forcing the institution all the time. So that is the second one.

The third one is the hierarchy. The design is quite a different problem. The problem is how to get a clear command, how to get to a decision maker. Obviously, you are not going to get it in the other two. It depends on the formal consent of the less privileged, unlike the market. It depends on the formal consent, not just on the de facto submission, so that there are many reasons why the dealers should be in a position of leadership. That is why it tends to break the liberal consensus to say that some human beings are more fit for leadership than others. It falls into this logical trap. This scares me. It really depends on what is survival on a mutuality of confrontation in the rhetoric of hierarchies. The chiefs or the leaders are described as public servants. They are at the top, but they are really at the bottom. This top and bottom crossfire is characteristic of the hierarchical structure if it is going to succeed. Reinforcement is very easy. The accumulation of wealth in there is easily drawn up. That gives it the wherewithal for the kinds of redistribution which indicate that this is public property and this is redistributed largesse. That is my description of the two types of societies and the reasons why they have been formed.

QUESTION: What do you do with the fourth model?

DR. DOUGLAS: They are the ones who are always there when there is a hierarchy and a market. They are appealed by the competitive cultural debate. They have been recruited as voters in a political system. I did not do very much with this particular community. I have written quite often about what the other people do with it because one of my colleagues has created an interlogical model for this. These models are forms of life and they are repeating with one another in an equal system and using one another. They back upon one another. In many situations they need support of numbers so that this fourth group is not necessarily affiliated and does not have many options. They are in a bad and extremely weak position. It would be better to put themselves together down at the bottom right. That is the dynamics of it. Are there more questions before we get through?

QUESTION: What are the dominant organizational structures of society in your view? The reason I ask is if one could consider any individual actor who is deeply involved, where would he be placed in the organization?

DR. DOUGLAS: You are asking a question which looks quite innocent but is very subversive about home enterprise. It concerns how much homogeneity I expect from that person. If we are moving from one situation to another, any selection would become part of a hierarchy in the morning and a market man in the afternoon. Do they go back home and become an updated person? This is a difficult question. I have put all my money towards keeping two things in place. One is that the individual is very pliable, but not as between morning and afternoon. I am supposing that the individual is choosing the action of the conflict in which it is operating. I am trying to keep open all the psychological possibilities as not to preempt any psychological theory. The position of an individual is an assumption there.

The heterogeneity of an individual at this point is not assumed. I have that, or I do not have a cultural system. I usually have the individual without a right to his life at any particular point in time. I need to have each system divided into certain kinds of rewards and penalties for the individual who shifts from one system to another. It seems necessary to assume that playing God in one way, they can hear themselves saying how

light is light, what it is to be a person, and where the rewards are. This would make it difficult for the individual to switch from home life to work life. I am quite sure that there is a high degree of homogeneity in the personal construction of their universe. Where there is implementation, there is persistent limitation in theory. If you are an individualist and are working as a shark in a sea of sharks in your office, you come home and you rely on your home also to be a sea of sharks. When you work, you work. You would choose a wife to organize your kids to be very upgraded and to perform in the dominant area of your life. That is to be investigated, but I would literally give up the idea of appreciatory homogeneity.

QUESTION: What you are talking about then is the dominant cultural pattern.

DR. DOUGLAS: Yes, that is what I am getting at.

QUESTION: The simpler processes of group affiliation seem important because once one is aware of what has happened in these other examples, one might discern a process called another market network, then the roles which they play at different times are a major cultural pattern.

DR. DOUGLAS: Let me not concede that. Let me not agree with you. Let us get into a West African situation like the individual in the history-like element where they are model. The people there have been fishermen and traders from way back. They had large organizations but these traders also have an age sectored peer organization. They do not organize it the way I have theorized. They have a peer organization if they are dominated by an individualistic culture. This peer organization has individualistic matches of type. The work in the organization cannot be carried forward in this matter. It is solely consuming. I would assume that it would be very individualistic.

QUESTION: You were mentioning the homogeneity of the individual. Could you say more about that?

DR. DOUGLAS: This is what the normative phase is about. During this phase, individuals hold each other accountable in the market system. If an individual cannot pay his debts they have to be punished. The shame is personal. It is not actual punishment or the will to punish, or the need to punish. In the hierarchical system, where there is a place for everybody, a demotion is punishment. The normative debate is about whether we must win on the justification or not. The pressured way of answering your question is to relate to your issues and where we started. The main point is how to deal with the interest in this with risks, or with disaster. The normative debate is partly focused on these critical issues, but it has direct answers to real problems of older people in a social structure. An illness or an accident is very common in older people.

Let us get back to the question about companions, rumor, perception related issues, and the conflict between safety and task, the protective device. I have some morals coming out of this which I only thought up for this occasion, although I have got many others. This is a research focus that can be cited for different aspects. Take the hierarchical structure, that is at the top right, and refer to the work of Steven Hatwell on rumors in wartime, and on the community's life's work. This work showed that where people were organized in strong compartmental grids, information travelled within and across compartments, and also across to other fields. There were people who became treated as, and who accepted the role of the accredited information process between such compartments.

These people took a pride in not passing on false rumors. The social structure itself then became a very tight system of scrutiny. It could never pass a rumor without it having three elements to take on and to focus on. A rumor could be, for example, that

we are going home for Christmas. You had to say the authorities say that we are going home for Christmas and that the authorities are coming today. The rumor needs a two or three part structure to have credibility. You had to say who you got it from so that you have to have some authority for it. On that basis, the people listening to the rumors would give them credibility or not. This piece of the set of criteria showed us that it has got a very high degree of accuracy about whether the Germans were at the door or not.

Continuing from that, there is rumor control. There is also reason to think that hierarchical structures compartmentalize that because there is panic in an open structure, possibly because it cannot control information. It is at the bottom left in the individualistic area and the network area. We do not have the authority and control over that information and they do not have structured behavior. Like a stock market, they are very panic prone. I would predict that would be the case.

Concerning safety protection rules, Steven Rainer, who uses this model, has done some work on low level radiation exposure. He investigated clothing, protection and exposure time. His argument is that when you have an individual in the situation where the work force is organizing an individual competitive system that emphasizes self-reliance and a kind of macho pride, the protection modes are partly disregarded. They are partly macho actions of others. This reminds me of the case concerning gas warfare in which the soldier in the trenches during the First World War continues without stopping to put his mask on. He went on at his task until he finally died. This is the macho situation.

You asked me about the top left hand corner on the diagram. I really do not know what else say about it. I think those people are out there in any particular situation. They would have a very difficult, but relatively successful experience because it is not working on them in a regular, predictive way.

The hierarchies to survive would like you to remove the eyepiece from the gas masks. The conflict arises between work first and safety first. The individual has got to do his job and he expresses himself under limited conditions. He is also the one who controls rumor. The kind of moral control and moral monitoring of the hierarchy places good emphasis on sacrificing the individual for the whole. It would seem that the hierarchies might be the ones who could do the sacrifice and be calm, handling that because of the individual experience.

The member of the peer group or sect, in the bottom right, is the person who is the whole environment which would be anger prone and who would be easily motivated by anger against outsiders. They would also be novel to panic and the victim of rumor because of the lack of a structure for controlling information.

This is where I will stop and have you bring it back to your concerns.

COL HOLLOWAY: In your example, you have this chap who is running away, having been exposed to chemical agents. I would like to choose another example and have you discuss that. You have a team working in an area of heavy bombardment. This area also has high levels of infection from malaria and black water fever. In this case, it is not a man but a hearse. The hearses go into the area bringing patients out, locating them, and treating them until they rot fundamentally of their own malaria because, unfortunately, malaria is resistant to chemical warfare agents. My interpretation of the that, when I saw what happened, was that this was a hierarchical organization which was performing a hierarchical job. Activity continued in that hierarchy with certain external commitments and certainly profit was not one of the commitments. I did not see very much macho about it in that sense. How would you deal with that example in the context of the other examples which you chose, dealing with the constant macho.

DR. DOUGLAS: This exercise depends on finding out which questions we need to argue about. I cannot deal with it as an individual issue. This method does not play that kind of tune in terms of how they were organized.

COL HOLLOWAY: The unit was organized as a research unit with an overall departmental chairman, and a research director, a person who did malarial slides, and a set of two to three public health nurses who went into the community continuously. These nurses and the man who ran the slides became malarious but continued to work until they dropped.

DR DOUGLAS: We need to know how long they were together.

COL HOLLOWAY: The overall length of time for this particular project was approximately two years. The overall time they were lumped together in terms of long term working was a period of approximately four years.

DR DOUGLAS: And they had been together three years before?

COL HOLLOWAY: When the events we are talking about occurred there were approximately four and a half months since it started from time zero. The time the malaria was transmitted to the time the project ended was about four months.

DR. DOUGLAS: So they had been working only a very short time together.

COL HOLLOWAY: They were working until they got sick.

DR. DOUGLAS: And they had to go into the community?

COL HOLLOWAY: That is where the people who were sick were.

DR. DOUGLAS: And what were their relationships to the people? Where is the test case if you have got all that information and a comparison? You have to allocate them with some other people and not threaten them with the grave.

COL HOLLOWAY: My question compares it to the chap standing in the trench in which the overall assumption was that he was macho rather than operating as a part of a hierarchical group. That comparison and the fact that I was raising my question was to question the readiness to interpret his behavior as macho.

DR. DOUGLAS: I am very happy that you have perceived that because I see it to enter some of your work. I do not know whether it was macho or not. The information is totally lacking in the material that I was reading to do any interpretation of this kind. It would be important to explain what the conditions are for this kind of analysis. It would also be valuable to study another malarial team to which some variation in the organization was present.

COL HOLLOWAY: The example concerning the malarial team could be expanded in many ways. Let me take it back to the example of gas warfare.

DR. DOUGLAS: I am glad you are taking it back in that sense. I have a fairly easy case to defend which is that those in any research that I know of have a real need for this kind of analysis to be done. It has to be done for now so I am in the negative position of running down any examples concerning the control and the organization.

COL HOLLOWAY: Tell me the research design you would like me to follow. What are the parameters?

DR. DOUGLAS: That is exactly what I was doing. It would be quite wrong to prepare the soldier to hear nothing about that soldier in the trenches.

COL HOLLOWAY: In the illustration we have discussed, there is a certain proximate situation. Whether or not the demands of that situation in terms of preservation of this group, for example, are so great that the sacrifice of his own life, but not on the part of the group, was absolutely necessary to achieve another end is unclear. It is unfair unless one knows in each case the context and the set of events that are being responded to. I would like to switch back to the theoretical issue.

DR. DOUGLAS: Would you mind leaving your example if we come back to it?

COL HOLLOWAY: That is the whole question of attribution of laymen in terms of group structure. You made a remark that in hierarchical groups the top of the hierarchy blames the bottom and the bottom blames the top. I wish you could do this for each of the group types. You are defining American culture right now in terms of hierarchical structure. Whenever the mysterious happens, we need to know what it is. The immediate tendency of the American public is to blame the highest level of government possible. That is the top of the hierarchy. I wonder what the system of blame and attribution is and how this then operates to organize and analyze.

DR. DOUGLAS: I feel uncomfortable dealing with the whole of America. Coming from England, I do find such striking differences in the attribution.

COMMENT: I am making the observation that, unlike Oscar Wilde, I have often felt we are two diametrically different cultures diluted into thinking we are linked by our common language.

DR. DOUGLAS: I thought he thought that.

COMMENT: No, he said we were divided by a common language.

DR. DOUGLAS: Yes, I agree. When I first got here, two years ago, I met somebody who had been in New York for six years. He said, "I really like it now, but it gets very strange, it gets stranger the longer you stay."

COMMENT: That is exactly the way we feel.

DR. DOUGLAS: There are difference between cultures. Things are much more adversarial and in that sense, are much more litigious. We have seen that escalating in the last ten years. I would look for the difference in the consistency between the different laws. I would look at the legal allegiances and the pressures which are to change. All systems are under pressure to change and some pressures get essentially pushed farther in the direction they are already moving and are not pushed in the other way. Discussing an example of litigiousness means that the American system is both far more sectarian in the bottom right and far more market oriented in spite of its corporate industrial structures. The people show it by talking about the question of homogeneousness of these individual persons. You get the cleanest example in the way the shops or the big stores are organized to expect you not to pass checks. In fact, it takes longer to pay by check here. There is far more mistrust and playing back upon you than at home. We put up with things that you would never put up with.

I have to give some more examples of blaming and control because it is important for medicine. It is important to the AIDS discussion at the moment and the moral issues being brought in. I would call Risk in Culture the book that Aaron Wildavsky and I wrote, a result of his pressure on my trying to think about the modern society. It started from the fact that our risks are infinite. The number of dangers that we are confronted with is unspeakable. We select the dangers that we pay attention to. We then notice that different individuals among us select different things because some people are overwhelmingly worried about them. This does not have much to do with what the risk analysts say are the most dangerous. Some people are much more worried about the risk of building up armaments than they are worried about the bad chemistry that might lead to war on the war front. Others are more worried about economic disasters and unemployment than they are about warfare, even in this country where you have so much.

Technology and the dangers of technology are another worry again. We find that the people who worry about one lot are prepared to worry about others. I think that the insight that Chauncey Starr had when he wrote about risk perception in 1969 was that we cannot blame people for risks that we have voluntarily assumed, but we do blame them. Also, we are much more aware of risks where we do blame them. He did not say that we would be more aware of risks because we have been blamed, but I would say that. In this country, the extent of blame and the possibilities of bringing individuals to book for our malfeasance is expanding all the time so that we are much more surrounded with some recognized interest in other countries.

You asked me to define the different parts of this diagram. In the book I wrote with Aaron Wildavsky, we were particularly concerned to understand the dreaming that was focusing on the technological dangers. That was the initial question and we associated this kind of thing with the bottom right hand corner, the grouping of people up and with the grouping of people in the sectarian or peer group sector. The way I would describe that now is slightly different. Let us go back to my description of how the peer group was formed, and why it would be formed. The peer group structure, given the tremendous difficulties of organizing life on that basis as compared with the market system, or as compared with the hierarchy, is far less prone to difficult ambiguity and lack of decision making.

The question I would now ask is why people would ever organize themselves like that. This is a group which is organized this particular way because it has to deal with protection problems. To separate the question more fundamentally, why would anybody ever organize on such a difficult form? It is because they have adopted goals which are not going to get the support of the larger community. There is a true sense in which the other forms of organization can muster consensus in a less positive state to aid that organization so that the market could not exist if we did not have a sustaining contract at all the points of the hierarchy.

The hierarchy cannot exist. The state protects the laws. The system only protects the market. We literally choose an issue which is important, which there is no case for, and which has not been given sufficient consideration in the main stream morality. The first part of the state will not support the direct resources towards your objective. Automatically, you are in the situation of a group that has not got coercive power. It has not got rewards and it cannot direct itself towards the subject. Then it is faced with this situation of defection and it would have to organize itself. It tends to organize itself against any outsider. That was what that book was about. The actual hatred of modern civilization and of the industrial military machine seems to ask to follow from the conditions of that organization.

COMMENT: I am wondering about this question of perception of risk, particularly that which we do not look at as a risk, how we sort that out, and how that was influenced in the actual decision making situation. In one sense, there is a key for making

the assumption that the perception of risks influences the decision-making. The intermediate aspect of playing the role is the position of the small meaningful social group. The completion that plays the role in that moment with an immediate kind of decision has to be made. When people are making an immediate decision under stress, we like to believe that the rationality for decisions is evident in the cosmology. But, very often short term decision making is dependent on a narrowing of any long term risk and of a very immediate perception and immediate situation. We have to ask what it means in the society that allows for a different kind of focus. It is that kind of translation that we want to think about.

DR. DOUGLAS: I am not sure that there is a question or a statement that I fully agree with here.

QUESTION: My question concerns the translation of the perceived risks, which are vague in a society, and how the society operates with a particular given situation such as malaria or gas in World War I. The latter was very different from the possibility of malaria because of the known aspects of its results and the terror which played such an extraordinary role when gas was first introduced. My question concerns the translation of long term, global risks versus the immediate situation of decision making.

DR. DOUGLAS: Do you mean inverse translation, or translation of an immediate means of risk?

COMMENT: I an referring to translation of our thinking in terms of the interconnecting.

DR. DOUGLAS: I would like to get back to that perception idea.

QUESTION: Let us take the example that gas warfare occurs, or that we have another Bhopal, which is another way of gassing people. That event occurs, and the people are confronted. Could you speculate within the context of your typology and analyze what some of the results would be within these various contexts of the group organizations? What would happen? What is the difference between a Bhopal and a Pittsburgh, or a West Virginia?

DR. DOUGLAS: I would not wish to make this kind of basic research on new unstable situations. I would like to concentrate on stable situations first. I would like to restate your question about research design. I feel that we are getting into the situation of empirical surprises without having decided what our thoughts are concerning what that kind of organization is and what we could expect from it, making sure that we have not put in any surprises for ourselves.

QUESTION: It seems to me that the most unusual situation, with regard to disaster, is surprise. If we are going to carry out a research design, the design created in time of non-surprise, we prepare ourselves to deal with the acute emergency situation. This country accents the improbability of war, but yet every 3.7 years within the last century we have deployed fundamentally into a war. It is not an infrequent occurrence. This whole set of events is treated as infrequent, terrible happenings. Earthquakes happen, fires happen, and accidents happen. Given that as a stable condition, could you apply that research to the design question?

DR. DOUGLAS: Could I take the question up two levels first? At one level, given this stable kind of society which cannot handle surprises, everything that happens gets placed in slots. This includes blame slots. Whatever new kind of crime anyone

commits can still be associated with the blame slot. This slot is identified with crimes as well as illnesses. It is anticipated in some way because we know who will be responsible or who will be held responsible. That is my approach. It is a very cynical approach and does not take account officially of every attitude which you are interested in. I would like to tell you about some research concerning surprise done by an anthropologist and some business people. The surprise game is commanded like an ecologist interested in crop observations and ecological responses to sudden changes and surprises. This is the framework of analysis for making predictions about how people are going to be surprised.

What we have found since we started this game is that the expectations about the universe, about whether nature is going to be very resilient and generous, or whether nature is going to be unforgiving and harsh are not unconnected with the social structure. On the contrary, the social structure that I was providing includes in itself the positive implications about blaming and who is responsible, along with whole sets of expectations about nature. Four models of nature were set up which correspond to the people who are living in these four corners. Nature is forgiving and resources will always come forward to fulfill human needs. We just must not push them too far. Nature has got the power of restoring her bounds. Contrasting that with the other view, it then comes out in the bottom left hand corner, which is the true bottom corner.

Nature is very fragile and in very short supply. It is liable to die on us if we are not careful. Given those two views and those two kinds of social structure, the surprise holders are the people who are in that situation and who are making their bets for their investments. According to the assumptions about nature, these people live in a world in which other people are making other assumptions about nature. They are liable to get a surprise because they think that the investments should be extremely cautious and that it would be disastrous to make wild bets. The people in the other corner, or the right hand corner who have a confidence in over-resilient nature are actually doing very well with their world investments and they are much higher on risk taking. That is the surprise game. You play it out by allowing for the percentage return on investments that you are actually getting, what their expectations are, and what would happen. That is one way of dealing with it. This game was produced for business investments. I would like to see it produced in response to academics. In this book, I mentioned the example of the difference between the English and the American disease control response to the swine flu vaccines. England is much more at the top right hand corner where the medical profession is much more closely structured. It is also much more bounded against the world and the patients and more mutually protected. They have also got the Ted Kaplow thing for scouting and testing rumors compared with the American medical profession. They could read the signs about the approaching flu and react by deciding to take a big risk about the vaccine that the English and the Swiss, reading the same signs, did not. I think that would be the kind of center I would like to see the research being done on, those kinds of surprises.

QUESTION: Is there a different perception of the future potentially in each typology that that impact of future loss will affect the behavior and the response? Even as far as whether or not it defines the existing surprises?

DR. DOUGLAS: Yes, and that is part of my unease with your question about immediacy because the structure of the society makes the difference or not. The harsh examples you give from warfare are beyond the level of theorizing. At this point, we should be theorizing about all the stable situations and interactions. In those stable situations, in the right hand corner, the very big dangers from a long way off that other people can push right off into the far picture cannot be put off. They are being used too much now in the social discourse and normative debate. They are imaginative structures as well.

COMMENT: It is an interesting point that our requirement in the drug testing issue is different from the test for AIDS. The group toxicity is different. One of the things needed for an open market economy is trust that there is something in the product; there is distrust in the product. It has to do both with the open market economy and the required test records. There is an interesting fallout that concerns safety. A number of drug companies now prove their drugs in the United States and then move their clinical test results to Europe. A number of European companies move their clinical test facilities to the United States as opposed to Europe. My prediction when this law was passed was the opposite, that we should go and test in the least stringent environment. In fact, they are testing in the most stringent environment. Having been proven in the highest market with the most stringent requirements, they have the most generalized and debated position in accordance with the rest of the world. They can minimize their drug development costs, which is a crazy outcome.

COMMENT: Americans are coming in exactly the opposite to the Third World.

COMMENT: But they do it for toxicity. Everybody tests for toxicity in the Third World.

QUESTION: We are getting at an intriguing part in terms of the general relationship in the social system. The perception of risk in the environment makes the same connection between the taxonomy or hierarchy of risk as opposed to the real risks in the environment. This is a reflection of the social structure. There are five major articles on risk assessment. One of them is on perceptions of risk and professional risk assessors to the general public. Concerning the general public, would you see the categories chosen in terms of either the history, our ability to generate the functions of this, or the adversarial impossibility? It is fascinating to find out that peanut butter is far riskier for you than nuclear power because it is a very potent carcinogen. The question is are the hierarchies of risk, the interpretations of actual risks in the universe, as much a function of the social systems that you are talking about as the orientations for its riskiness?

COMMENT: When we do a survey we tap into some select cultural perception of the universe of risk.

COMMENT: I want to add onto that just exactly the same question. How come people do not know bicycles are dangerous? That is my version of that question.

QUESTION: Do you see the difference between real risk and the hierarchy of risk as being the key to the basic social structure that one is talking about?

DR. DOUGLAS: Are you asking me whether the real risks are described by the risk analysts?

COMMENT: No, as described by the laymen.

DR. DOUGLAS: The lay culture has not always seen the risks of its social enemies. What was the comparison with?

COMMENT: Perhaps I have a non-question about what you define as the orientation towards the concept of risk as a key element in the social structure. The question I am asking concerns the orientation towards the content of risk as well.

DR. DOUGLAS: I do not think that is the way to go perceptually. I thought that one should try to distance himself from the content of particular risks and to categorize risks in terms that make sense as corresponding to things in a social structure. In that way one could research that correspondence, when it is just too conflict-laden. I would like to translate your question back into saying that given the social structure may or may not have special capacities for differentiating the future into long and highly differentiated segments, it might have everybody's short picture. Would you then find that the concern with risks was equally differentiated? I expect the answer would be yes. I would choose rather abstract compositions of the risks we are under.

COMMENT: That is an interesting question. I do know people who sit around in terror about whether the sun will go out, considering this a real threat in terms of their own identity.

QUESTION: One of the questions I was wondering about concerns perception of control. Using the counterpart of the conception of risk, I was wondering why peanut butter is not considered to be as great a risk as nuclear power, or a bicycle, versus other things that there is a perception of control over?

COMMENT: The situation of control might be related again to the integration of the kind of cohesion within a society, and the immediate report system within the social structure. This is in terms of what security existed. It is unusual for you to say we cannot apply that to warfare. The question we are looking at is that any particular disaster could be conceived in some ways as new and unexpected and in some ways as expected. Again, it is a function of newness. Where warfare is repeated, there are certain repetitious situations that one can expect. That kind of controlled, similar behavior which I call ritual of a sort can protect against this and can function in a cohesionless group.

DR. DOUGLAS: I think it does. I am very concerned to get it into the diagnostics rather than the response. I would like to raise another issue concerning the people who worry about the sun going out in seven billion years. This kind of approach, being cultural, involves fewer individuals. If there is actually no use to their worries, if operating on anybody else just is not their worry, they are not in this story. I may be speaking to cultural phenomenon but what I would like to really insist about for the reports concerning the bicycles and the peanut butter, is that this approach requires you to ask questions. You are supposing that these people know the background to the risks and that they are asking themselves the question, what am I supposed to do about it? It is not what I can do about it, but what am I supposed to do about it because other people are monitoring me. That is the essence of this approach.

The essence of this approach is that nobody takes the risk of decisions by himself. You go to mother or you go to your aunt. Your neighbors are going to blame you if you let the dog out, or if you do not see your children. You are under continuous surveillance unless you are isolated, living by yourself, worrying about the sun going out in seven billion years. What we have to look at is what kind of reproach these people are bringing against each other. Whether that policy is to help you when you are in trouble would depend on whether you took their advice. There has been some splendid work by anthropologists on choice of physician in cases of medicine and the difference between how many physicians you try. This is chronic. You have to keep up because your neighbors say to you, "you did not go to my doctor so no wonder." The one you did go to comes around and helps the children. There is this aspect. This is the only aspect one can connect with the nuclear degeneration of cultural attitudes.

What then becomes an interesting question for this kind of an attitude is how you can use that statement, at a very high level of risk taking, in the bicycle example. I am

drawn to the comparisons made by the historians of different epochs. In different cultures there is an expectation that a person is not a person unless he is prepared to take very high risks. This is generally a relation from the occupational structure, unless the occupational structure is one in which there are rewards for high risks and disasters but no risks. Then the whole level, the zero points, would be set at a very different position than it would with other kinds of needs.

Let me give an example of the fisherman who buys a new boat. We have a student who is talking about selling his fish is but he is not sure where they are at this place. They encourage them to take enormous risks. We could get blamed for it and the support for his family would be forthcoming in the same way. I like the discussions of Virginians in the 18th Century. These colonizers came over and depended on the tobacco trade. They had extraordinary risky climactic and soil experience with growing tobacco and selling it. This was coupled with even more risks with the seeds and the creditors and traders in England. They worked with a very low expectation of life. They died like flies all the time. They were not old. They were not about to worry about peanut butter.

What strikes me as important to this discussion, is that once people live in a community in which risks had to be taken, everybody takes risks according to Tim Brie's book. More and more risks and gambles are created. We never meet another chap without knowing a gamble. Every possible thing you could bet on and think about, has big bets placed on it. Risk taking is built into the whole culture. It would not be so in Puritan England.

QUESTION: Are you viewing risk as a single category? You set off a chain of thought in my head. I consider our psychotic society as being the risk culture in the United States wanting to be discussed everywhere. It might not be related to the occupational shifts that have taken place in the United States or the shift toward service industries in which white collars work. We are continuing occupational patterns which are physically risky while doing everything that we can in terms of our national values insisting upon a minimum fiscal risk. Doing this, we certainly move into an arena of very high economic risk. Is this a transformation of one into the other or can it be such that we make it out in different kinds of risks?

DR. DOUGLAS: It does not seem to me that it is true that there is less risk in this culture, physical or other. There seems to be plenty of it.

QUESTION: This is what I meant.

DR. DOUGLAS: Yes, and we have the fantasy there. The idea of the risk between cultures seems to me to be closely related to the blaming capacities of the cultures themselves. That is what I look for.

QUESTION: You are used to sectarian organization?

DR. DOUGLAS: No, the two bottom lines are regarded

COMMENT: Right, you are getting two bottom lines, the sectarian and the other.

DR. DOUGLAS: They go well together. They have certain values in common individually so they can share the direction.

COMMENT: One of them is a high risk statement setting.

COMMENT: It is particularly difficult. One of the things we could state about our factory system in the United States is that it is interesting to find such a high physical risk perception in an industrial setting.

DR. DOUGLAS: Are you discounting major accidents?

COMMENT: I am discounting minor accidents.

DR. DOUGLAS: That is because now you have got to afford insurance.

COMMENT: We maintain certain high risk categories for certain high risk industries in which we increase the pressure as we hire work personnel.

DR. DOUGLAS: There are a lot of workers in a high risk society.

COMMENT: That is correct.

COL URSANO: I am interested in the group expanding in a way that Dr. Douglas may perceive that we do disservice to her work and so she can correct us. One of the excitements of hearing something interdisciplinary is that it triggers neurons that have not been triggered before. It stimulates new questions for us to ask about our own areas even though they may in some way be a distortion. Dr. Douglas' correction of those distortions may lead us further down the line of thinking about some areas.

Let me make a few comments around that. I was talking with Craig Llewellyn earlier about a gross simplification of the question of how the future impacts on the individual. We maintain that the better trained troop has greater survivability. One would presume that this is not just a question of training and how rapidly you could put on a mask. It may also be a perception of their future in a particular environment and their ability to survive. Perhaps it varies with how long they think they can survive. It matters to them whether or not they feel they can put on their masks fast. That means they could survive an hour. It matters to them whether or not they see that their commander knows what they are doing because that means they can survive three days. It matters to them whether or not they feel like their base can survive and that it is well protected because that means they can survive for two weeks. There must be a time gradation in terms of the picture of the future as well as what the future can be. That must relate to the way in which the group is composed as well as the way in which the individual operates within the group.

Secondly, it may be a gross distortion of Dr. Douglas' work, but I think it is worth thinking about. From one picture, the military system is clearly entirely hierarchical. One can ask about the qualitative gradations within the operations of subgroups within the military. Is the operation of a squadron, the operation of a platoon, the operation of a company, better described in some areas where I am confronting some task as a peer group operation? Is it always better described as a hierarchical operation? It is at times described as a free market, particularly in the operation of drug abuse? One question we would have to ask concerns the operation of units in a CBW environment and more specifically, the operation of the units inside the SCPS system itself. Is its design then functioning as if there is a gradation of how people operate on wards inside of hospitals from the hierarchical to the peer group to the free market? Will that impact that group's ability to function inside a unit when we know that this group in this culture will be contained over a certain period of time? Already we can define it. It has limited resources. We can even define how long those resources will last because we know that they are stocked for 92 hours and will operate up to 30 days with replenishment. Clearly, some of the questions concerning the way in which those small group cultures are formed, whether or not those affect the perception of risk or performance in that

setting, are questions that seem central to what we are working with. Dr. Holloway, do you have any comments?

COL HOLLOWAY: In talking about the military population, it is terrible for us to differentiate between populations that are working without clearance as opposed to with a security clearance. There is a quantitative and a qualitative difference. I am not sure that there is a system of direction. This probably reorients the organization because I do not think one can generalize how that experience is internalized. I am not sure that is helpful beyond thinking about what you are describing and thinking about personal experiences. I am not sure how I can describe how one can set a baseline in a combat experience as compared with almost any kind of civilian population with the exception of what miners describe as a major cave-in. Miners who do tunnels have survived cave-ins and then have gone back to work.

COMMENT: I want to make one comment in terms of social structure based on what Bob Ursano and Paul Bartone were just talking about. That is the military structure that we talked about. In both hierarchical and non-hierarchical formal senses, a staff organization is not hierarchical. In fact, in the Army regulations it states that there will be informal staff rotation in all staff officers and there will be informal communications work between all levels of NCO's. There is an NCO chain and there is a professional chain; there is not a hierarchical chain. The whole business of requiring an informal chain is itself an interesting business.

COMMENT: I would agree with Craig Llewellyn's point about people who had experienced pain. There is a distinction if you participate and define what a measure of society says about how one should act in that circumstance. There is also an evolution of how people do act and their anticipation of how they should act. I think that that second state is quite different in some way from that first one. It has to do with saying the disaster is over.

QUESTION: When an earthquake takes place in San Francisco, the reservoir that is on the river, right on the fault, is going to break. There is a variety of things that can be done to repair the break. I do not think the things that need to be done are being done in relation to that regarding the mechanism of disaster preparedness per se. When those people operating in that kind of a situation do not know what to do, are shocked, are paralyzed, or even run off, what they have learned is the sense of the risk. What will happen in that circumstance even though they have not been there before, is a change in their perception.

DR. DOUGLAS: That is a rider on the difference between the grids that one is experienced with and yours. I question the degree of hierarchy and branches of hierarchy.

COMMENT: There is another way of saying this, following up on what Dave Marlowe was saying before. Do systems and facts create these various models in real complex society? The literature that you are arguing with contends that your peer group or sectarian group survives the fact that hierarchies do not retain some elements of that peer group.

COMMENT: Between the overall structure of the social system and the overall structure of Army's social system, there are many nodes that are not hierarchical. The overall structure, the key to it, happens to follow a hierarchy whether or not they are in reality. Transformations take place which remain hierarchical, a soldier will still return to the security. Security is a man who is still functional enough to ask what will be next.

I think we must not confound the primary group. Peer groups can be non-hierarchical and still retain the overall structure of the system the way it is intended to work and normally does work.

COMMENT: The distinction I am making has to do with the command structure and the overall organization.

COMMENT: How about patterns of thought? The way in which the institution is organized. A squadron or a platoon organized in essentially a non-hierarchical fashion cannot function effectively in combat.

COMMENT: I want to make a distinction. The Army has things called project managers for weapons development. That exists in this same organization. That organization may not be organized according to this structure.

DR. DOUGLAS: I see a question that is very technical which I do not think I can get into concerning the identification of the degree of whatever it is in a social group from three places. That is actually two questions. The one about this being perceived and exposed is hard to deal with. Methodologically, it is difficult to do this kind of analogy which means seeing that we absolutely require stable patterns. There is no question about the reformation of a group towards new channels after the experience. This involves a fine tuning of issues for us to perceive the changes in the organization requiring measures about level of hierarchy. What do we mean by hierarchy? Where does the hierarchy actually fit? In what part of the hierarchy does it fit? I would like to get into that issue.

My husband was coming back on the train in the restaurant car with an Indian officer. There was an old Indian swami there. He said, "I see that you are both vegetarian and non-vegetarian", hierarchical and non-hierarchical. You have to get at the hierarchy and the market in the Army itself.

Let me discuss the work of Steve Rader. His thesis as a student in London was on far left political groups. They were so far left that they were Maoists in 1970 and they were awaiting the imminent arrival of Mao's forces to take over London. They were the only people who knew about this and they did not think it was at all necessary or important to have any links with a party or with the rest of the left. They would take the isolated, tiny groups and every now and again, he started them. His thesis was that the perception of the future and the number of steps that would work taking account of the individual in the future and how far away a thing might be, varied with the number of grids of space that was covered in reaching other social groups. There are 97 Maoists groups in London, each with about five or ten or twenty members at the outside. Of those, the ones that had the most contact with the outside had a longer time structure. There was a correlation between the number of people that they dealt with of different kinds than themselves and the amount of wills in their head about whether Nazi electronic devices were really hovering over London and this very minute could come back.

I thought that was quite interesting, but it was only an idea, just something to be tried out. This same person published with a mathematician. Columbia University called Jonathan Gross' book Measuring Culture. I asked them why it was called Measuring Culture since it had nothing about culture in it whatsoever. He explained in a Gramtian way that since culture was a social organization, he was ashamed not to call it culture. What they mapped out was a rather subtle and over-complex piece of methodology about hierarchies which could be applied to produce ratios on both these dimensions. I will show you how the questions of hierarchy do not have to hang around. The word hierarchy, what we meant before we came into this discussion about hierarchies, could be refined and changed and brought down to something that could be

actually measurable for a particular meaning or a particular task force from day to day. Try to do that. It is called the exact theorem.

Before we could test his experiment, we need to have two groups, and to have a perception of time. We want to know whether the more hierarchical individual has a longer story caution and future.

First of all, you choose the groups. Before you start the comparison, you want to know what activities the groups do. You are thinking here of military groups. I cannot pick this up. I am trying to remember this book with a military example. One example concerns two churches. You know that within the two churches, there is the church choir, there are the old peoples' outings to be organized, there is the liturgy, and the passing of the plate. You have got all of those activities and whenever there are activities, there is the possibility of roles. I have got the roles clearly demarcated and have given names to them. Of course, if you were doing a serious comparison, you would want to know the time span. You would decide your time span, systematically or essentially, to be over a certain reasonable period. You have got to know the questions you are going to put through and whether that perception is related to social structure, that being the only amount to be criticized. They are not going to be there all the time. You need to say something about the time span in relation to the turnover of members.

"X" is the number of individuals. Certain things would be measured for the group, and other things would be measured for the individual. Now you start to think about the requirements for a group. You want to know the nature of the group and the kind of group that you want to compare between these two associations. Between these two Presbyterian churches you want to know whether one of them has people who meet everyday and whether the other one has people who only meet on Sundays or once a month. If they are very infrequent, the group cohesion will be given the lowest score.

The scope of the activities of the group will vary. You might be going to the church every week without seeing anybody. That might have very little implications for the group. If you have got most of your life involved in that group, you have a large amount of scope. It would be very large in scope for the invitation of its members.

There are some major work requirements about the group. I gave the example of network but what you might want to know is whether all the members know each other. You might find a member that will lead you to all the other members, or you might be already in direct contact automatically. You might have to go to the minister in order to meet the other people, or you might reach each other and him at the same time. The minister is hardly ever there. We like that kind of thing about meeting.

So you conclude your list, but you are always composing it. You can put it on a ratio of what is possible. If there are five members, then you could reckon the ratio of possible interconnections between the different members of the group. By having it turn into ratios you can make the comparison between one group and another group on the gridwork. You can examine how many of the activities involve specialized roles, how permanent the allocation of the specialized roles is, and how many of them are symmetrical in the sense that everybody rotates and takes on the role of secretary. In the latter case, they get no marks for grid because grid is separation of people pushing them up into separate compartments. The secretary is always the secretary and always has been the secretary. No one could do the preaching except the pastor. How specialized the roles are is a measure of grid.

You set up a very systematic basis for everything that you wanted for the past or transitivity. For example, if you have a host-guest relation, and the host is always the host and the guests are always the guests and they never rotate, this narrows the grid.

As far as hierarchy, that is our way of thinking about it. We have had very, very low marks for grid and thanks to our marks for group, I would predict that this church would have a very particular kind of sermon, a hellfire sermon. It would have a restrictive admissions, not open to the peers. Recruitment would be very interesting to investigate. Those are the rough lines of the handbook which I think holds much for the

competent in these kinds of network analysis and comparisons. Comparison of grids allows for a more clear view of the peer group that was called in for a particular kind of activity. How long to stay with the group, whether after the earthquake or after the combat experience, is an important issue relating to the hierarchy.

When you gave the example of the experience of combat changing the group itself, I thought of that play about the Admiral Criton in which this family gets back on this island and they have disappointments. Admiral Criton, who is the butler, becomes a leader of everybody. Nothing will ever be the same again after this. It becomes a hierarchy which had not previously existed.

You could measure it. I think it is important, but I have a lot of trouble explaining to people to invest in this kind of comparison for risk perception and, perhaps, the danger of its conclusion.

COMMENT: This is a comment on designs. We are examining whether belonging to a particular kind of group affects your perception of risk. It seems to be very important to know what kind of persons are involved. It has been my observation officially and politically, and especially environmentally, that they ought to belong to what appears to be the scene of the hierarchical group which they perceive as being exceeding egalitarian. I wonder which of these things one should score.

DR. DOUGLAS: I am sure that you really should not score it by our known measures, but then you see what you are comparing it with.

COMMENT: What I would like to compare it with in that group is being a peer versus those who are simply in that same group. I saw it as being hierarchical. It has been my observation that those who deal with everyone in the peer group are welcome to take lots of risks. It is one way of exposing themselves. There are those who had a variety of accidents in the hierarchy.

DR. DOUGLAS: In the same group?

COMMENT: Yes, in the same group.

DR. DOUGLAS: There is something about the united commitment to the group that is involved there. Are those people going to be there next year, the ones who know better?

COMMENT: We gave a conference presentation on terrorist groups with particular studies of the Red Army in Germany and in Italy. These groups tended to fall in some of these ways like this. Our data suggested that people were in extremely conforming roles. They had to act in certain ways. There was a high turnover in these groups, both with casualties and with staff. This was because they became, in some way, funny and they left. Most of them were casualties and were relatively small. It was not a wide separation. The thing that kept them from being hierarchical was that there were flat groups. There were no big changes in men and there was lots of interchange following casualties, although certain people were stable.

It seems to me that you look at those types of groups, and they do tend to be described as egalitarian by members and non-members. They describe the groups as having a demanding quality. In other words, once you have left the group they require you to do something. On the other hand, they say that from there we require that because it was previously required.

COMMENT: That is saying to me is that this structure is authoritarian and hierarchical.

COMMENT: There is a difference in the groups that were described as far right. There was only one of those cited. Although some of the PLO groups are somewhat that way, they are relatively conservative. They have more stages in the hierarchy. They are likely to have more of a parallel organization that looks governmental, and there are connections with family again. This has not been proven empirically. Those that retain outside connections with the community describe themselves as hierarchical.

COMMENT: There is not much difference.

COMMENT: The question that I asked you during the break might eliminate some of this. The idea of looking at each of these is to ask where the autonomy was in it, not which one has the most, but where in each of these is the autonomy and where is the restrictions. We talk about these extreme groups, saying on the one hand there is an enormous autonomy that has a far out philosophy, for example, which we engage in acts of terrorism. On the other hand, there is an extreme amount of restriction in that hierarchical arrangement. I am wondering what this kind of viewpoint has illuminated about decision making and autonomy to make decisions. We perceive that these risks prevent us from acting.

DR. DOUGLAS: I would like to say something in reply to that and related to the elocution about these horrid deaths and far right terrorist groups. Clearly, we are able to think about the bottom right hand corner, the peer groups there. But we did not know about them and have not thought sufficiently about the far right terrorist groups which are very important and very interesting. Aaron Wildavsky has the political structures most highly developed as part of his analysis of this. The question needs a lot of preparation in order to answer it. I would like to try that.

COMMENT: I would like to make a point regarding the discrepancy between what the different members of the group say, versus going to some member and asking him what kind of a group you are.

DR. DOUGLAS: I was going to address that point because it is an important one. Where the ambiguity would turn up and the big discrepancy between what the different members of the group say is the big issue. That is why I started talking about the right wing terrorist groups that I am just beginning to learn about. It seems that we have left out the possibility that small groups on the far left individualistic side, in which people come together and talk to the Italian-Franco Federation, are starting right wing political groups in Italy. He described them to me as really groups of theorists who are competing against terrorists gangs who are competing against each other in feats of outrageous courage, which is quite different in structure.

It would be very hard to go inside that group to be sure which kind it was. It could fluctuate according to the pits and chains. They self-destruct very quickly. That makes me want to tell you about Aaron's work on critical regimes. He has thought a lot about the kind of political structures that are acceptable and feasible on top of these kind of social structures. I always think of the far right, but peer group is one that does not have leadership. We used to feel very badly because I had not thought about the Jim Jones experience. Obviously he had gotten a more particular politic than a personal politic. He had gotten a charismatic one. I had not gotten any explanation of the enormous amount of power he had. I realized that I had not been thinking at all about the political side of it. My inside psyche about the individualistic politic comes from reading in anthropology about very individualistic cultures in tribal systems where a man is a leader so long as he can lead. The minute he cannot lead, the minute he has failed a

single battle, everybody else reverts to some aspect of their cosmological speech to explain why he failed and why they should leave him.

The model that got us in on the side of the Italians, and the best example of that that I am aware of in anthropology, is a book by Dr. Berber. The tribesmen he studied, the Ferver, have a reputation with leaving an unsuccessful leader the minute he is unsuccessful because he has lost his power of leadership. God has left him, so we had better leave him, too. It is up to validation in the market side for leaving the unsuccessful leader. Something has happened and it is no longer a mystery.

In that case, it would be a very shifting scene from the outside and for insiders as to whether it is egalitarian or not, but Jim Jones is on the other side. Aaron explains that they cannot make leadership. They are organized so they are more afraid of detectors and they have not got the authority. They have organized right actions of authority so that there is only one kind of authority that they could accept. It has to be a charismatic kind from right outside the social system. It would, at least, have to be a supernatural authority and then it is what you call all or nothing afterwards. There is no hatred and there are no checks or balances. That is what helped me in trying to understand the Jim Jones occurrence.

QUESTION: This is the sectarian model?

DR. DOUGLAS: Yes, this is a very common model, but I knew it was.

COMMENT: That is an interesting point about Jim Jones concerning whether the structure had a hierarchical core or whether it existed at some level of egalitarian or peer model. Some will say, Gee, it is wonderful, I have all these friends and I am one with this group who is just like me." And other people are turned away by this structure. I think it has to do with their individual psychology. It might be interesting to know that those people who view the military as hierarchical have a different perception of risk than those who see it fitting other models.

COMMENT: I would like to raise an hypothesis that is part of my perception of the military. The individual, that for 14 or 15 years in, has never been reassigned, and has served in one regiment has a very different experience than a person who serves in multiple regiments and has multiple ranks. These individuals experience the hierarchy in a very different way. Social experiences in an organization that is segmented and isolated with various compromises is part of the reason we have different perceptions independent of individual areas.

COMMENT: Not only different perceptions, but different behaviors.

DR. DOUGLAS: That is helpful because then we would pull a feather about your different people, about how long they had been there, and the construction of that unit. That is exactly what the exercise is.

COMMENT: This is related to the time question. Do you relate this concept of hierarchy to Elliott Schapp's concepts? If so, how, and to what extent are these ideas admissible?

DR. DOUGLAS: I would like to comment on the ideas of Everett Dicks involving responsibility and the time span of responsibilities. He introduced a measurable idea into these comparisons. Unfortunately, the pressure he has placed on sociology has not allowed him to stand back and to create other substructures within the possible scope of time span. His time span is just one dimension. He has not added any other dimensions. All he has gone on to do after that first great idea has been to subdivide and

subdivide and subdivide. It is a very minor flap. We could have an added time span plus the boundary element. The time span was a green connection. It would have much more interest in generating the kinds of culture.

COMMENT: There is one thing in earlier publications, and that is something that I would be interested in in addition to the time span analysis. He talks about the boundary to protect against paranoid anxieties. The idea is fundamentally that once one has become a member of one of these climbing industry groups, the investment of one's own identity in the maintenance of the boundaries of that group are not neurotic at all. They exclude the level of denial. It is so absolute as to not admit the possibility of testing another kind of reality. I will separate that one. That is what I mean by psychotic. It directly affects what is perceived as reality, and what is not perceived as reality.

DR. DOUGLAS: I wish we had kept him in the conversation, or at least had a joint conversation with him at that stage. That is how it seems to me, but I give reasons for why they are at the boundary so they are not tempted to think of psychotic people moving into it. The temptation merely puts it that way.

COMMENT: The problem with this is the reason it is called psychotic. There is no first hand observation as in the context of a psychotic breakdown. However, it turns out, not for all the properties of the psychotic person, being psychotic. It is a general property.

DR. DOUGLAS: I must prefer it not to be a psychological asset of the person. It is something that they are involved in. Other people are pushing them towards them for good and quite rational reasons.

COMMENT: The thing you might not like about this is that there is a certain part of it that says watch what is joined to make the investment. The maintenance and the investment follows it.

COMMENT: Were there any predictions that you would make from your typology if it was a relatively closed group, in contrast to an open group, as to the ability of the group to sustain itself within that typology or the pressures to shift to another typology? Which one of those would you see as enduring? Which ones would you see more subject to internal alterations or from alterations due to lack of new resources?

DR. DOUGLAS: We have thought a great deal about that. There are two ways of enduring. One is actually to have continuity if you have the personnel and the resources to pay it. That is, all the personnel in the same relationships as criticized by the system moving through it.

Another sense of stability, in which that group breaks, we fought in that same way. The system is stable. There is a group that is not to the contrary and in which, for the first time, the continuity and the hierarchy is very strong. It has got much going for it in the way of being able to draw resources into it and then withdraw them. But, each of these types could have been a special block that it fails upon. The hierarchy really depends on the control of information because it has got to keep the compliance of everybody to the system. If they get to know about other systems or other ways, any kind of free distribution of material is also obsessed. Hierarchy is restrictive very frequently and I am not wishing to go with constructive humor deliberately around it. It is a much more open form of censorship than you get in a market which is blind.

What happens to the hierarchy that self-destructs really depends on a third invasion from the bottom up and the top down. It tends to be paternalistic and to pay

the paternalistic rites that were not optimistic from the bottom up information. If it dies because it cannot hear news from the outside or from below, the information does not matter. It is not like changing around it. It will probably be all right and this is a characteristic of history. It is analytical, but it is not that way in Central Africa and of all the monetary movement that we are trying to organize on paper. They cannot help, stabilize, or reproduce that form of organization. They do that by eating one another or whatever they can in witchcraft. They are real people.

It has to be so evil on a cosmic scale, that they choose one another in order to master enough information against an undefined book. We have an agreement about what is an evil except suspicion in the outside destroyed groups. That is the wave of bad event codes. That is how you direct the barracks and extraordinary resilience, especially when they have a very good way or resisting the forces of decay. The market is fundable from a monopoly.

QUESTION: What would be the distinction between hierarchical and horizontal kinds of interactions that may indirectly go up or down? I think about what it would be like to create a truly egalitarian society or a totalitarian society iike Russia. You could have it all relating to the top, instead of integrating each other. Neighborhood associations in this country would have different regions integrating them, at a horizontal level, and everything would have to go through the hierarchy. Part of the control of the nation that does not allow for questioning the boundaries or integrating with the other part would be honored as well.

DR. DOUGLAS: Taking all the information for centering and then giving back is very ambitious. It annoys like an energy base exercise.

COMMENT: But it guarantees a form of homogeneous compiiance because we do control information.

DR. DOUGLAS: That is what hierarchy is all about.

COMMENT: Part of it was the question you asked about the Army as a hierarchical board. It is hierarchical and I think that some confusion has to do with actual hierarchy. What are some of the horizontal kinds of integration in courage? And how do they integrate them with the hierarchical level?

DR. DOUGLAS: He did not tell me about the difference between the Americans and the English Armies. I had thought that it might be more of a peer group type. He described the American Army as much more corporate and hierarchical in different ways from ours, which is very interesting. It should not take that great affectability of ours because of our class structure. I was very impressed and amazed by the loving community that this characterized with parts of the Army of the regimental system, the long continuity of the Soviets, and the absolute possibly risked dependence between them.

When I went to Edinburgh to pick up my husband, General James Cooper, he talked to me about the expense of the Army. I asked him about his dependence on his men, and their dependence on him. He said he depends on them very much, and he wishes he could do more for them in the way of watching them through the system. The attitudes of responsibility are what we have to look for to get these risk-taking characteristics.

COL URSANO: I appreciate Dr. Douglas' coming and talking to us, sharing her thoughts, and engaging us in expanding our thinking. Thank you.

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ADAPTATION TO A CONTAINED ENVIRONMENT:

THE ANTARCTIC EXPERIENCE APPLIED TO CHEMICAL WARFARE

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Forsan et haec olim meminisse juvabit.
(Virgil, Aeneid Bk. I)

Planned defenses for use in chemical warfare include construction of contained environments such as the SCPS-M (Survivable Collective Protection System-Medical) which will house medical treatment facilities during periods of up to four days during chemical attack. The facility will have a staff of about 10, and patients numbering up to 100. In planning and testing this contained environment (CE), we are drawing on experience with other CEs so that we may optimize function and minimize adverse effects on personnel. Review of experience in Antarctic winterover indicates that success there is governed by fairly simple principles:

* Select personnel who are interested mainly in doing their jobs well, who are comfortable with conventional social interactions, and who do not get excited easily.

* Give the workers a leader who will let them do their work, but will organize group activity when needed.

* Let the group get acquainted before they are isolated.

* Let the work situation structure the group.

* Give everyone as much privacy as possible.

* Work them hard and feed them well.

These principles can be applied to the SCPS-M, with its unselected population, only after modification. The specific recommendations will be presented. Experience with this CE will be valuable, for it is unique in that most inhabitants are not workers, but are in a passive role.

INTRODUCTION

The history of warfare repeatedly describes how development of a new offensive weapon leads to elaboration of an effective defense. Of the types of defense possible, one of the most useful is to shield a warrior, or group of warriors, in a box that is impermeable to at least some of the weapons of the enemy. Man has learned useful lessons from the turtle, the clam, and the coral.

As the military armamentarium gains chemical and biological weapons, defenses evolve to cope with this threat. These weapons create an environment that will infect or poison or in some other way harm humans. The entire environment becomes hostile to humans. The generic defense from a hostile environment is physical isolation of the human and provision of all life-sustaining necessities from safe supplies. The human then lives in a contained environment: he and his life support are contained together protected from the hostile environment.

The purpose of this paper is to examine the psychological impact of life in a contained environment. We shall look at what has been learned about life during winterover in Antarctica, and attempt to apply that knowledge in making plans for use of the Survivable Collective Protection System-Medical (SCPS-M), a contained environment designed for medical use during chemical warfare. We shall look at ways in which life in a contained environment can be optimized and ways in which adverse effects can be minimized.

CONTAINED ENVIRONMENTS

Description of a contained environment

Human experience with contained environments is extensive. Noah's ark was a dry place in the midst of a deluge. Every ship at sea today can be considered to be a contained environment, providing protection from the sea and carrying all necessities of life. A medieval castle insulated against a multitude of threats and each of our homes is a contained environment where we are protected from the elements and can lock out dangerous humans. We do not think of life in ships or in our homes to be a particularly severe psychological stress, so it is necessary to say in a little more detail why winterover in Antarctica and the SCPS-M Unit deserve special attention.

The hostility of the polar climate or of chemical warfare is extraordinary and the degree of containment required for protection is similarly extraordinary, but it seems clear that any specific effects of the hostile external environment from which a group is protected are small in comparison to the effects of being confined in the contained environment (Gunderson 1969). Of importance is that the contained environments necessary in Antarctica and in chemical warfare are usually physically much smaller than a person's ordinary living space and lack the spaces necessary for privacy or recreational activity. There is no escape from unwanted human company. Light is artificial, air must be processed before use, and food and water supplies are limited. The inhabitants live under these conditions for long periods of time (days to months) and cannot leave at will, or without outside aid or permission, or without in effect entering another, transportable, contained environment. Living in a contained environment is very like being in jail. The difference is that the contained environment protects the person from the environment, while the jail protects the environment from the person.

In Antarctica or in chemical warfare, the contained environment exists in a double environment: around the contained environment there is the hostile environment and around that a more remote friendly environment on which the contained environment depends for its original configuration and for continuing support (material or moral), and to which the occupants expect eventually to return. It is of some importance that the inhabitant must cope not only with his contained environment, but must maintain a relationship with the outside.

Adverse effects of contained environments

That time in a contained environment can have an adverse impact on the inhabitants is common human experience. The Bible makes it clear that Noah did not want another voyage in the Ark. A child is sent to her room as punishment, a man is put in solitary confinement as punishment, a schoolboy is put "in Coventry" (not talked to by his peers) as punishment.

The idea that isolation is an adverse experience gained scientific scope and definition when it was demonstrated that a reduction in varying sensory input disrupts vigilance, orientation, learning and thinking, motivation, task performance, and ability to adapt. Individuals in environments featuring sensory deprivation experienced somatic symptoms and strong affective states, such as anxiety. Varied environmental stimulation seems vital to effective thinking, stable feeling and adaptive behavior (Hebb 1949; Heron 1961; Kubzansky and Leiderman 1961; Meyers et al 1962; Solomon 1965). It is now clear that intensity of sensory input does not make up for monotony and inability to interact with the environment. When physical activity is limited concurrently with limitation of variation in sensory input severe perceptual disturbances may result (Fiske and Maddi 1961).

These adverse effects of limited sensory input and motor activity gained practical importance as military, commercial and scientific probes into hostile environments necessitated the creation of contained environments that were to be inhabited for extended periods of time. The nuclear submarine, the space vehicle, the oil-drilling platform, the Antarctic station, and the isolated missile site each became in turn an opportunity to learn about the reactions of humans in contained environments and an opportunity to apply what had been learned before. Of particular importance was that these contained environments gave some information on the way in which people with particular personalities and past life experiences interacted in structured groups in contained environments (Wheaton 1959; Gunderson 1963).

Plan of this review

This review will survey the literature concerning a particular type of contained environment, that found in Antarctica, to see what is relevant to projected conditions in contained environments designed for chemical warfare conditions. It will concentrate on those aspects of the Antarctic experience that can reasonably be expected to approximate a chemical warfare contained environment. We shall be interested primarily in the adverse effects of the contained environment, that is, those effects which are expressed in impaired thinking, subjectively uncomfortable feelings, or maladaptive behavior. The goal of the review will be to relate specific stressful characteristics of life in the contained environment to adverse effects of contained environment, with the intention of suggesting modifications that may minimize adverse effects.

In reading and interpreting this review, it will be necessary constantly to keep in mind that while we are attempting to find similarities among contained environments that will help us manage the SCPS-M Unit, there will be some fundamental differences that will limit our ability to transfer information and ideas.

Past reviews of Antarctic literature

The reason why we know so much about adaptation to Antarctica is that there has been 30 years of experience in screening personnel who were to winterover there.

During one of the first winterovers, a man had a psychotic episode that was very disruptive to the function of the winterover station (Nardini et al 1962). As a result, a

program was set up to screen out personnel who might develop serious illnesses. As time went by, the screening program that was originally intended simply to eliminate pathology evolved into an attempt to define which personnel would adapt best, with an annual on-the-ice evaluation at the end of winterover to see how personnel had actually adjusted.

The literature concerning adaptation to Antarctica has frequently been reviewed, usually to assess and improve the screening procedures (Gunderson 1974), but there has been an effort to apply the lessons learned in Antarctica to projected work with other contained environments (Kanas 1987).

For application to the SCPS-M Unit, the most relevant Antarctic experience is probably at the base at McMurdo Sound, so this review will concentrate on the literature concerning McMurdo. This a fairly large base, with more than 100 inhabitants in most past years, and three distinct sub-populations (Navy, civilian scientists, and civilian skilled labor). McMurdo has a hospital and medical personnel and is organized along military lines.

THE CONTAINED ENVIRONMENT IN ANTARCTICA

Conditions in Antarctica

That Antarctica is a hostile environment for man scarcely needs emphasis or detailed description. It is a continent of extremes, the coldest, driest, highest, windiest, most inhospitable place on earth. Winterover is a six month period when no one can enter or leave Antarctica because of the severity of the weather. The inhabitants then live in contained environments except when they go out, in protective clothing, to accomplish needed work. During the period of winterover, there are four months during which the sun does not rise.

The physical isolation and social closeness of the Antarctic winterover experience have attracted attention from psychologists since the first explorations. From the outset, mental disturbances were prominent (Gunderson 1974). For the early explorers these disorders of thinking, feeling and behavior were a threat to success of the mission and sometimes even to survival. Fascinating though the early accounts are, we shall direct our attention to more modern conditions, where the winterover is part of a planned work cycle and the personnel involved view it as stressful but not likely to be fatal.

For human adjustment in Antarctica, the significant stressors are not the cold and darkness, but are the isolation of the group, the sameness of the social environment, and the absence of customary satisfactions and gratifications. The inhabitants of an Antarctic station are deprived of their usual social and family support, they have limited recreational activities and a relative decrease in environmental stimulation. They are confined in a small group where they have little privacy and enforced intimacy (Mullin 1960; Strange and Youngman 1971).

Who goes to Antarctica to winterover, and what they do there

The purpose of the Antarctic winterover is primarily to support a variety of scientific projects that require that on-the-ice observations be obtained during winter. The people who do the observations, the "scientists" are usually technicians, graduate students or postdoctoral students who are implementing the research plan of an absent established scientist who is the principal investigator. Some principal investigators do winterover from time to time, but it is more usual for them to come to Antarctica only

during the summer season. The winterover scientists are usually very interested in the work they do, even when it is, seen in its essentials, tedious and repetitive. The group of scientists is organized with a leader who is called the National Sciences Foundation Representative and who is the station leader if there is no Navy Officer-in-Charge. As a group, the scientists tend to be intellectual, mildly eccentric, and antiauthoritarian.

There are two support groups, Naval personnel and civilian skilled workers, who keep the base running so that the scientific projects can exist.

The Naval personnel include Navy construction workers (SEABEES), who keep existing facilities operating and prepare facilities for the enormous influx of personnel who come for scientific work in the summer season, and other support workers, such as mechanics, radio operators, meteorologists, supply clerks, and medical personnel. Most are senior petty officers with good work records: past military performance ratings for winterover applicants higher than for other, non-candidate, Naval personnel of comparable experience (Gunderson 1964a). The Navy has its usual command structure with an Officer-in-Charge. As a group, the Naval personnel tend to be highly work oriented.

The civilian skilled workers operate power plants, repair telephone lines, and similar work. They are a mixed group, mostly itinerant blue-collar workers, but with a few college drop-outs in search of adventure. This group also has an assigned leader. They generally do their work competently, but are rarely highly invested in it.

Each base has its own mix of scientists, Naval personnel, and civilian skilled workers. In the smallest bases, scientists predominate and a scientist is the base leader. In the largest base, McMurdo, the Navy predominates and the Officer-in-Charge is the base leader. Except that Naval personnel are subject to the Uniform Code of Military Justice, the sources and limits of authority of the base leader are not well defined, and this has occasioned significant community conflict (Blair and Gavin 1984).

Screening for duty in Antarctica

Candidates for assignment to winterover in Antarctica are screened for physical and psychological suitability before assignment. Screening and debriefing is an accepted part of the winterover culture, and is viewed by most candidates as stupid but innocuous. Some individuals do find it traumatic (West 1984).

The psychological screening procedure has changed little since it was first started in 1957 and consists of a pair of clinical interviews, one by a psychiatrist and one by a psychologist, and the completion of paper-and-pencil tests, inventories, and questionnaires.

The interviewers are trained and have a knowledge of the environment for which the screening is done, the criteria for screening, and the results of prior validation of the screening process (by evaluation of the adjustment of those who were screened in prior years). When psychiatrists and psychologists, each one using the procedures and sources of information characteristic of his profession, were compared as screeners, there was general agreement in identifying potential stressors and personality characteristics relevant to coping with these stressors (Gunderson and Nelson 1964), and in interpretation of biographical data (Gunderson and Kapfer 1966a) even though there were significant differences between professionals in evaluating some specific personality traits, such as those related to assertiveness (Gunderson 1965; Gunderson and Kapfer 1966).

The list of tests, inventories and questionnaires used in screening has varied over time, but biographical questionnaires have been used consistently (Nelson and Gunderson 1963a). At one time the Rorschach Test was administered, but not useful in predicting adjustment to winterover (Gunderson and Kapfer 1966b), and was discontinued.

To validate the screening process, the adjustment of those who went to Antarctica was measured by personal debriefing interviews and by a variety of inventories and questionnaires, varying somewhat over the years, such as peer nominations for return to the Antarctic, supervisor performance ratings and medical symptom checklists (Nardini 1962).

The screening process has been a success to the extent that no further disruptive psychotic episodes have occurred during winterover since screening began. At small stations, there have been some men who may have experienced brief psychotic episodes (Rohrer 1958) and at larger stations, there have been severely disfunctional individuals who were effectively handled by their communities (Blair 1983; Blair and Gavin 1984). On one occasion, a case of paranoid psychosis required physical isolation and neuroleptic medication (Strange and Klein 1974).

Although there was no validation of screening by deliberately sending candidates who were thought to be unsuited to winterover, some information exists on a subset who were sent even though they were thought to be less than optimally suited and on unscreened personnel who were allowed to winterover as last-minute replacements. There has been a significant occurrence of moderately severe pathology in these groups. but none of psychotic proportion (Nardini et al 1962). Some individuals who have successfully completed one winterover have shown moderately severe pathology on a second winterover (Blair and Gavin 1984). This suggests that screeners may overvalue successful experience in Antarctica as a predictor of future success.

Motivation for duty in Antarctica

All personnel who winterover in the Antarctic are volunteers. They can apply to go if they have some skill that is needed there. The motivations for these candidates are difficult to identify fully and even more difficult to evaluate in terms of their adaptive value. A motivation which would be favorable in one environment or for a particular person may weil prove unfavorable in another place or for another person.

For the Antarctic winterover, some of the motivations that must be carefully evaluated include excessive ambition and pride, indiscriminate enthusiasm, wish for adventure, and escape from adverse environmental conditions (Law 1960). For military personnel, one possible motivation is a hoped-for escape from military regulations and authoritarian structure. This is not a good motivation (Mullin and Connery 1959). Most of those who are seeking to pit themselves against a hostile environment will be disappointed because every effort is made to make the contained environment of the Antarctic base non-hostile and because individual workers are too valuable to be allowed to waste themselves by gratuitous encounters with danger. At debriefing, one often hears the comment that the experience was very tame or that the weather was not as bad as an ordinary Wisconsin winter (Blair 1983; Blair and Gavin 1984).

Favorable motivations include hope of practical gain (financial, occupational, assignment, promotion) and a moderate wish for a challenging experience (Nardini et al 1962). A lifelong interest in Antarctica is common among candidates for winterover, and is favorable (McCullah 1977).

A strong motivation to go to Antarctica is negatively correlated with adjustment, at least for Navy personnel. The negative correlation is probably related to disappointment following unrealistic expectations. For civilians, whose experience is more likely to measure up to their expectations, there is no such negative correlation (Gunderson 1968).

How adjustment in Antarctica is measured

Adaptation to Antarctic winterover station life is an ongoing process of emotional, work and social adjustment. Success depends on a complex interaction of group structure, specific work roles, and individual demographic and personality attributes (Nelson 1963).

Information on adaptation was gathered during winterover and at debriefing by means of interviews, diary observations, supervisor and peer ratings, attitude and symptom questionnaires, medical and psychological symptom check-lists, formal psychological and sociometric tests, records of incidence of accidents, injuries, drunkenness, and verbal or physical aggression, and records of weight changes, alcohol purchases, and sick-call visits. (Blair 1983; Blair and Gavin 1984; Gunderson and Nelson 1962, 1962a, 1963, 1965; Holmes-Johnson, Nelson and Gunderson 1963; Strange and Youngman 1971).

Mail questionnaires sent 6 and 12 months after return from Antarctica proved to be valid, with good agreement between ratings obtained by mail and peer and supervisor ratings obtained during or after winterover (Nelson and Gunderson 1964).

Success of the winterover mission requires that the personnel do their work effectively. By effectiveness is meant a combination of responsibility and dependability with technical competence. Success also requires that personnel get along well enough in the group that they do not interfere with others doing their work. Thus, of the measures of adjustment during winterover, job performance and compatibility (i.e., ability to fit in with the group) were of particular importance, and these were correlated.

Technical competence, by itself, can make up for much psychopathology (Nardini et al 1962). While it was necessary for the members of the group to be proficient in their work, compatibility alone was not enough for good adjustment, but it seemed that when an individual was compatible and willing to work a lower level of job proficiency was tolerated (Nelson and Gunderson 1964).

A measure of effective individual performance was developed on the basis of peer and supervisor choices of individuals whom they would prefer to have with them should they return to the Antarctic. The behavior characteristics important in the measure were emotional composure, social compatibility and task motivation. Emotional composure (or stability) included the characteristic of accepting authority, social compatibility depended more on considerateness than on social orientation (outgoing or retiring), and task motivation was more dependent on work effort than on work competency (Gunderson and Nelson 1963, 1966; Shears 1966; Nelson 1965; Nelson and Gunderson 1963). Peers and supervisors were in good agreement in rating most dimensions of adjustment (Gunderson and Ryman 1971).

What predicts adjustment to winterover

Biographical data and analysis of personality characteristics proved to be a very good predictors of adjustment to winterover.

Biographical data: Positive factors: A history of past personal effectiveness, job experience and accomplishment predicts a good adjustment in Antarctica.

At least for military personnel, potential for success is positively related to age; men under twenty-five years of age do not do as well as older men (McGuire and Tolchin 1961; Weybrew et al 1961). When personal history data for military personnel were related to adjustment criteria, it was found that age was positively correlated with emotional composure, and age was also weakly correlated with years of experience, previous stressful duty assignments, and advancement in rank (Nelson and Gunderson 1963a).

Those individuals who were considered to be emotionally stable expressed neither strong liking nor a strong dislike for most recreational activities, and the well-adjusted Antarctic scientist was indifferent toward many common recreational activities (Gunderson 1968). Married men tended to be more stable and contented than unmarried men, but were more likely to worry and have poor morale if they had bad news from home (Law 1960).

Biographical data: Negative factors: Self-oriented activity such as reading and strong hobby interests was negatively correlated with social compatibility. Delinquent behavior and truancy were negatively correlated with work performance, especially in younger personnel, and non-traffic arrests and school expulsion were negatively correlated with emotional composure and task industriousness (Nelson and Gunderson 1963a). In reviewing the past history of individuals who are to be assigned to winterover it is important to evaluate adverse information in light of the time that has lapsed and what the individual has accomplished since the event (Nelson and Gunderson 1963a). Any biographical items suggesting alcohol or other substance abuse or dependence are contraindications to Antarctic assignment. Such indicators include frequent job and assignment changes, disciplinary actions, slow promotion, and overt alcohol-related events.

Newly married men (less than one year) are risky choices (Law 1960).

Biographical data: Differences in stations and sub-populations: For civilian personnel, in contrast to Navy personnel, neither past delinquent conduct nor need for avocational activity were correlated to adjustment.

Size of hometown was correlated with performance, but with different directions in differing vocational groups (Nelson and Orvick 1964).

Overall adjustment to winterover was better for civilian scientists than for civilian weather personnel or for military personnel (Gunderson and Nelson 1964a). This difference was attributed to the fact that the scientists were most highly motivated to do their specific jobs (Doll and Gunderson 1969).

When compatibility in small (three to six man) work groups were studied, homogeneity of age was found to be correlated with compatibility (Nelson 1964b).

Individual personality characteristics: Positive features: For successful adjustment, at least for military personnel, favorable personality qualities include emotional control, tact, self-sufficiency, conformity, low achievement needs, and mild pessimism. (Gunderson 1968).

For successful adjustment to a closed group the individual must be sensitive to his social situation and have a tolerance (if not understanding) for others, but sensitivity that is coupled with personal insecurity and suspiciousness makes the individual abrasive to others and uncomfortable himself. Gregariousness is no advantage. An ability to withdraw emotionally into one's self is of great value, for then a person can maintain, despite a lack of physical privacy, a private world into which they can retreat. This type of person has been termed an "Educated Isolate". The extrovert does less well than more inner-directed types, and the "life of the party" soon becomes abrasive. A sense of humor and an ability to differentiate important from unimportant issues is helpful (Law 1960; Palmai 1963; Strange and Youngman 1970).

Among those who adjust best are those who most enjoy unsophisticated and somewhat superficial social activities such as "Bull Sessions", food, and movies, as long as these individuals do not use alcohol to excess (Strange and Youngman 1970). Probably the single most important factor in successful adjustment is that the individual is happy in his work, has a sense of usefulness and self esteem, and gains recognition of this from peers and supervisors (Gunderson 1966a; Strange and Youngman 1970).

The way in which an individual handles boredom is important. Intelligence and education may be an advantage to the extent that such individuals are more flexible, have fewer rigid prejudices, have wider interests, have greater inner resources, are more

self sufficient, and are not easily bored. Intelligence is also an advantage when the hostile environment must be met (Law 1960).

Self-control is essential, and even without instruction most of those who winterover seem aware that strong feelings must be restrained. Another facet of this characteristic is tolerance of others and unselfishness. For civilian populations optimism is favorable and pessimism and cynicism are unfavorable. A sense of adventure is desirable, but not necessary (Law 1960).

Individual personality characteristics: Negative features: Negative personality factors are aggressiveness, impulsivity, excitability, hostility, and high achievement needs (Gunderson 1968). Individuals who handle feelings of inferiority by aggressive or contentious behavior do not do well, nor do arrogant and pedantic individuals (Law 1960). Demanding, sensitive and narcissistic individuals do not do well (Nardini et al 1962). Enthusiasm, especially evangelical religiosity, strong anti-alcohol opinions, or any kind of moral fervor, are very abrasive during winterover (Blair 1983; Blair and Gavin 1984; Holmes-Johnson 1985).

Individual personality characteristics: Differences between stations and subpopulations: Those who volunteer to go to Antarctica differ in many personality characteristics from defined populations such as male college students and male general adults, but civilian and Navy volunteers differ little in personality characteristics (Ford and Gunderson 1962).

In general, results from small stations revealed important differences in the personal attributes that are related to performance criteria (Gunderson and Nelson, 1965a). For civilians hobby interests, motivation, and achievement needs tend to be more positive factors than for Navy personnel (Gunderson 1968).

Psychodynamic characteristics: Psychodynamic analysis was not helpful in assessing candidates. Adequacy of defenses is more important than character of defenses, and very rigid candidates do not do well. In Antarctica one must be flexible in the face of group needs (Nardini et al 1962).

Who adjusts well in Antarctica: Some generalizations

A concise description of the person who is successful in winterover is as follows: he likes his work and does it, and does his part in community work; he is quite conventional by community standards; he does not get excited easily. He is a dull drudge (Blair 1986).

People who are in themselves interesting, or who are intensely interested in Antarctica, do not do particularly well unless their specific work interests are satisfied.

Leadership

Leaders are important in stressful environments. There is a general consensus that nothing is so important in Antarctica as good leadership. There have been many attempts to define what a good leader and good leadership are in Antarctica. In studying all that has been said, one is left with the impression that a good leader in Antarctica tends to let his crew do their work without interference, but organizes group action when necessary.

Leadership style: In Antarctica, especially in small stations, esteemed leadership correlated with a democratic orientation and leader participation with the men, with a personal man-to-man relationship between leader and men, and with a leader who respects and seeks the opinions of his men in matters which directly concern them, especially technical matters. This style is thought to work because it matches the psychological distance between leader and men with the actual physical and status

distances forced by the situation, and because decisions are based on the best available information and are supported personally by the men. In an emergency an autocratic leadership style is necessary (Nardini et al 1962; Nelson 1962: Nelson 1965). It is possible for a Navy Officer-in-Charge successfully to insist that Naval personnel adhere strictly to military rules and protocol. This is not well accepted by the men, who expect a unique experience (Holmes-Johnson 1985), and tends to create in the community a double standard of behavior that is destructive of morale (Blair and Gavin 1984).

Personal characteristics: Popular and unpopular leaders are similar in that they both are aggressive and industrious, but they differ in that popular leaders are more self-confident and alert, have better emotional control, are more adaptable, and help to maintain harmony within the group (Nelson 1964a).

There is a marked similarity between the personal characteristics of desirable leaders (as rated by followers), and desirable followers (as rated by leaders), with a common attitude of teamwork and respect for various forms and sources of authority. One characteristic that cannot be shared is need for dominance. Group compatibility in small (three to six man) work groups is reduced when members had equally high needs to be prominent through leadership status (Nelson 1964b).

To some extent, the characteristics of a group leader are correlated with his success. Favorable characteristics are emotional control, flexibility, concern for the individual, neutrality toward controversial issues, and "likeability" (Gunderson 1966a). Other favorable characteristics are ability to tolerate intimacy and leveling of status without losing the authority role and the respect of the group, and self reliance in command (Strange and Youngman 1971).

What good leaders do: A good leader watches for the development of aggressive clique rivalries which might impair team spirit, and is careful not to associate too closely with any one group. A good leader can maintain his position despite the fact that much of the work, and especially the general load of cleaning and similar tasks, is divided on an egalitarian basis. If duty assignments are set well ahead of time this seems to prevent arguments and quarrels (Law 1960).

Problems leaders have: Leaders are particularly prone to develop depression and other emotional symptoms (Strange and Youngman 1971). Leaders are sometimes the focus of the anger and resentment of the entire group, and must be able to tolerate this. The leader can be completely isolated from the group by these feelings directed at him. It is not necessary that the group be fond of the leader, indeed, there is evidence that, as long as the leader can tolerate the hostility, there is an increase in group solidarity when the leader becomes the focus for inevitable hostilities. It has been claimed that some leaders have deliberately attracted the resentment of the group in a successful maneuver to unite subgroups who were in destructive conflict (Mullin and Connery 1959; Law 1960).

Co-leaders: When there is a medical officer in the group it is common for him to achieve a *de facto* position of leadership supplementary to the designated station leader. The medical officer has a natural position as a protection against danger, and has a special position as "father confessor" (Law 1960). In small stations, the personnel tend to see their leader as successful and to deny his faults, even when he was so ineffective that an unofficial leader emerged to fill the leadership gap (Strange and Youngman 1971). When the co-leader or unofficial leader creates the impression that he is supplanting or controlling the designated leader the crew resents this and seems threatened by it (Blair and Gavin 1984).

Group structure and cohesion

Developing group cohesion: It is very helpful if the group which is to occupy an Antarctic station has an opportunity to orient themselves to the group before they are

confined. A great variety of intentional activities, group and individual, intellectual and activity-oriented, have proven useful for promoting cohesion (Law 1960). In Antarctica, group cohesion is usually developed during the summer before winterover, when the winterover personnel begin to identify themselves as a group separate from the summer support personnel and are able to establish relations under conditions less confined than those of winterover. Personnel who come in at the end of summer as last-minute replacements are always considered to be in some way different from the rest of the group, and if they turn out to be good shipmates this is viewed with some surprise (Blair and Gavin 1984). Once the group is confined mutual support and good will are critical for maintaining efficient group functioning (Gunderson 1963).

Developing group structure: In even the smallest stations, group structure during winterover is a constellation of sub-groups determined primarily by work place, but with subsidiary determinants which include ethnic background, education, berthing arrangements, taste in music, etc. (Blair 1983; Blair and Gavin 1984; McCullah 1977). Over a six-month period group structure with regard to work, formal communication, and off-duty friendship interactions remains stable (Nelson 1964c). Work role appears to be more important than other factors in determining the structure of the group (Gunderson 1966), but heterogeneity in cultural backgrounds and personal values may affect the structure of work groups (Gunderson and Mahan 1966). Group compatibility and group work accomplishment were highly correlated. Groups which were either clearly formal or clearly informal were more compatible than groups that were ambiguous in structure (Gunderson 1968a). Larger groups (20-30 members) are more likely than smaller groups (8-11 members) to generate member perceptions of compatibility and accomplishment. The rules that govern work role in the group are of great importance, and any change in work role may have a large effect on the individual and the group (Gunderson 1966).

An engrossing commitment to some single goal, such as a scientific project aids small groups in developing feelings compatibility and accomplishment (Doll and Gunderson 1970), and contributes as well to preservation of individual morale (Ryman and Gunderson 1970). In small groups there was a rather low level of leisure activities (Doll and Gunderson 1970a). In the smaller groups feelings of hostility tended to be higher (Doll and Gunderson 1971). Low avocational activity was correlated with a better adjustment at the smaller winterover stations, but the opposite was true at larger stations (Gunderson, Nelson and Orvick 1963).

Stages of group formation: The dynamics of group formation and interaction are described in three stages: (1) The individual members evaluate each other and form pairs based on similar interests and backgrounds. (2) Larger groups develop. These share similar age, authority positions, occupations, or avocational interests. Shared preference for types of musical entertainment is important. (3) The group coalesces, forming a single core that excludes one individual or a small group.

These stages are somewhat fluid but are important in determining the nature of conflict between subgroups. The pace and final form of group formation at a particular station seems similar from year to year and may depend on such factors as the physical configuration of the station (Palmai 1963; Strange and Youngman 1971).

Some observers found that morale declines and there is a net increase in group conflict as time in confinement increases (Palmai 1963), but others found that at least one sub-group (civilian scientists) maintained morale through the winter (Gunderson 1974). Because of the tendency of work groups to form rival cliques, some group leaders have manipulated berthing assignments mix work group members (Law 1960). Under the conditions of the Antarctic winterover "trifling personal peculiarities can cause mounting exasperation, and harmless peccadillos which can produce serious resentments" but a great deal will be tolerated from an individual who is good in his work, and whose work is important to the group (Law 1960). The group tends to have dif-

fering expectations for individuals in particular work roles. Cooks, for instance are expected to be sociable and gregarious (Gunderson 1968).

Privacy: Despite the emphasis on group cohesion, it is important to provide each member with a private space where he can withdraw voluntarily. Paradoxical as it seems, in isolation the inhabitants need privacy. The work-space can under some conditions provide private space (Law 1960; Nelson 1964c).

The group in relation to the outside world: Conflict between the isolated Antarctic winterover station and outside authority is frequent. It has been suggested that this conflict arises in part because the group leader attempts to deflect to the outside authority some of the dissatisfaction which would otherwise be expressed toward him. With the exception of radio operators, whose business it is to communicate with the outside, most men in the station tend to lose interest in what is happening in the outside world (Law 1960).

Contact between individuals and the outside world needs careful management. To the extent that it can serve to calm anxieties about families and loved ones, communication can be very helpful, on the other hand it can be very demoralizing when those who are isolated are told about problems about which they can do nothing (Law 1960).

A complicated pattern of morale, related to contacts with the outside world, has also been described. There is an initial low level of morale as the group is impatient for the summer force to leave so that winterover can begin. The enthusiasm felt at the beginning of isolation wanes until the sun reappears in the spring, and this renewed enthusiasm is maintained in anticipation of the arrival of relief. After relief the men are lethargic, lacking in exuberance, cynical, isolated and drained (Law 1960). If there is to be a midwinter airdrop this is eagerly anticipated, but afterward there is a pervasive unhappiness about what was actually delivered. The first of the summer support crew are welcomed, but later they are resented because they show little appreciation for what winterover has accomplished--the new crew is more interested in what they will themselves accomplish during summer (Blair and Gavin 1984).

In the winterover station the locus of control tends to be ambiguous. Because the crew is isolated they tend to feel that they are in control, but communication with the outside world constantly reminds them that superior authority there configured their world, still supports them in many ways, and will expect an accounting at the end of winterover. There is often a marked ambivalence about outside authority, with demands for intervention alternating with complaints of interference. The situation is exacerbated because there is no adequate and agreed-upon set of rules for conduct and authority in Antarctica (Blair and Gavin 1984).

Sexuality

Accurate evaluation of sexual activity in Antarctica may be impaired by the fact that much of the available information concerns American Navy personnel, to whom homosexuality is a taboo subject.

Heterosexuality: Until recently, most winterover groups have been all male, and lack of sexual activity seems not to have been a problem. All who apply to winterover are self-selected to experience a period of sexual deprivation--no one who feels a need to have frequent sexual intercourse chooses to go to Antarctica. On the whole the candidates appear to have a rather low sexual drive (Blair 1986). The men do not have constant environmental stimulation by the presence of women and sublimate by hard physical work. Large numbers of erotic pictures are sometimes in evidence, but sex dreams, nocturnal emissions and masturbation are only slightly more frequent than normal except during times of emotional distress or in anticipation of return to a heterosexual environment. The scientists, who are intensely interested in their work, show

rather less sexual activity than the Navy population (Mullin and Connery 1959). The Navy personnel are, of course, accustomed to long periods of sea without heterosexual activity, and comment frequently on this both during screening and during debriefing.

An increasing number of women are now being assigned to winterover in Antarctica. Three modes of adjustment are commonly used by them. The most common is to establish a sexual relationship with one of the males (often a dominant male) in the group and to maintain this throughout the winter. Another choice is to be everyone's friend but the sexual partner of no one, claiming exclusive sexual attachment to someone who is not in Antarctica. The third choice is social isolation (Blair 1983; Blair and Gavin 1984; Holmes-Johnson 1985). The men of the station have mixed feelings about the presence of women. For some it clearly impairs the masculine-adventure quality of Antarctica to have women present. More commonly the presence of women is valued for its non-sexual aspects, as a social leaven, and for the women's nurturing and mothering qualities. Those women who isolate themselves and are not available for non-sexual social contact in the community are bitterly resented (Blair 1983). Exclusive sexual pairing is rarely resented unless some resulting favoritism or unfairness is perceived (Holmes-Johnson 1985; McCullah 1977). Sexually toned remarks and jokes are disapproved by those who wish the social presence of women, but are rarely commented on by the women themselves (Blair and Gavin 1984)

Homosexuality: Unpublished first-hand reports indicate that overt homosexuality is rare, even though the men sometimes form close and even affectionate relationships marked by sympathetic and protective behavior (Law 1960; McCullah 1977). A high level of homosexual banter prevails in some small stations throughout the period of isolation (R.D. Walk, personal communication), and on occasion the presence of effeminate mannerisms or behavior can cause difficulties in the group (R.E. Strange, personal communication).

Psychopathology

Definition: For the individual, the term "pathology" indicates undesired changes in thinking, feeling, or behavior (with "behavior" including individual work performance and psychosomatic complaints). For the group, pathology is expressed in unwanted changes in group harmony, cohesion, or work performance. In studies of adjustment to Antarctica, presence of these changes contribute to a judgment that adjustment has been poor, and a finding that adjustment has been good implies a relative lack of these changes. It is, however, important to remember that estimates of impaired function are relative to the special conditions that prevail in a particular contained environment. In one report from Antarctica a severely schizoid and withdrawn man was considered by his peers to be one of the more capable and valuable members of his party (Mullin and Connery 1959)

Causes of pathology: The important stresses appear to be prolonged confinement, social isolation, monotony, space limitations, reductions of work load and social and recreational activity, absence of usual outlets for emotional tensions, loss of usual sources of satisfaction, and social cultural differences (Gunderson 1966; Strange and Youngman 1970).

Effects on the individual: Evaluation of Winterover experience leaves no doubt that the contained environment has an important impact on individuals. Large and consistent changes in perceptions concerning group member compatibility and teamwork have been reported, and it has been suggested that these changes might be modified by changing group composition and physical facilities (Gunderson and Nelson 1962a). The most marked and consistent change in emotional reactions in Antarctica are sleep disturbances (insomnia, the "big eye"), anxiety, depression, withdrawal, hostility and irritability (Gunderson 1963, 1968, 1969; Matusov 1962). Insomnia and depression

are more common in the military than in the civilian group, and for the military the symptoms tend to get worse during the winter. There are no differences between military and civilians in anxiety symptoms (Gunderson 1968; Doll and Gunderson 1971). Men at smaller stations tend to have more anxiety and depression, and more hostility early in winter, than do men at larger stations (Gunderson 1968). Many of the symptoms reported would be expected to have a deleterious effect upon motivation and social adjustment, and there is, indeed, a general decline in work satisfaction, social relationships, and group accomplishment. Maintenance of group harmony is difficult (Gunderson 1963; Gunderson and Nelson 1963).

Depression: Depression is so much a part of winterover that it may be considered to be a normal reaction. Although complaint of depression is very common, objective measurement by depression rating scales shows that moderate to severe depression is unusual (Blair and Gavin 1984; Holmes-Johnson 1985). The social withdrawal, irritability and decrease in motivation and work performance that often accompany depression are problems for the group as a whole.

Disorders of thought: While formal disturbance of thinking is rare during winterover, many individuals tend increasingly to base perceptions of what is important and what is unimportant on local emotional issues rather than on objective evidence (Strange and Youngman 1970).

Cognitive disturbances: Disturbances of cognitive functions occur during winterover. These include subjective impairment in concentration and memory, and slowing of intellectual activities (Gunderson 1966b; Strange and Youngman 1970). Mild fugue-like states have been described, as well as preoccupation and inattentiveness during conversations (Mullin and Connery 1959). To the newly arrived visitor the sense of time in those who have been in winterover seems grossly distorted. They behave as if they had unlimited time available, they speak and write slowly, tend to be unpunctual for appointments (either early or late), and show no inclination ever to end a conversation (Blair 1963; Blair and Gavin 1964). This slowness may be at the basis of one source of conflict between the contained environment and the outside world: those in the contained environment believe that they are working very hard and being very productive, those observing from the outside think little useful is being accomplished in the contained environment.

Severe disorders: Even though isolated emotional symptoms are common in Antarctica, emotional problems that clearly would merit diagnosis of a major psychiatric disorder are rare. During the period 1961 to 1962 the rate of diagnosed psychiatric disorders was 3/100 for Navy personnel in Antarctica, which may be compared with a hospitalization rate of 1/100 for Navy personnel worldwide (Gunderson 1968). When diagnosable disorders do occur it appears to be a result of activation of a latent emotional difficulty by some current situation. The stress of life in Antarctica does not make normal people psychiatrically ill (Strange and Youngman 1970). Serious (disabling) emotional disorders usually occur in younger men (under 25) and within eight weeks of arrival in Antarctica (Law 1960).

Psychosomatic disorders: Prominent among psychosomatic complaints were headaches. These were attributed to need for control of aggression, and were more common in those who most felt the need for careful control of aggression (Mullin and Connery 1959). Psychosomatic disorders of dramatic and disabling severity can be seen, especially in men who find themselves attempting work that is beyond their competence (Law 1960; McCullah 1977). Some headaches that seem to be simply a result of overwork (Law 1960). The minor gastrointestinal and back pain problems common in the military population are not particularly prominent in Antarctica (Nardini et al 1962).

Insomnia: Insomnia is so common in winterover that it might be considered normal, and it seems to cause few problems except at small stations where one wakeful person can disrupt the entire group. Insomnia is worse during the period of constant dark than it is during constant light, possibly because of the greater physical activity

possible when it is light. Those who can adjust their own work schedules, and sleep when they wish, tend to come into conflict with and elicit the envy of those who must adhere to 24 hour schedules because of the nature of their work (Blair and Gavin 1984; Law 1960).

Substance abuse: Alcoholism and other substance abuse have been prominent in descriptions of winterover, and is important in Antarctica primarily because personnel who ordinarily seem stable can exhibit marked change in personality and be exceedingly disruptive when intoxicated (Law 1960).

Many of the Antarctic stations for which we have good records had alcoholic beverages legally available, and some had illicit drugs, especially home-grown marijuana, available. Abuse of alcohol tended to express itself in older personnel as impairment of effectiveness and leadership ability, and in younger personnel by release of hostile, aggressive, and socially disruptive behavior. Despite these potential problems legal alcoholic beverages have been made available to avoid recourse to illegal and potentially more disruptive recreational drugs and because it may offer a desirable escape from tension when used in moderation.

Despite a strong emphasis on screening out personnel with known or potential alcohol problems every winter has its share of alcohol-related incidents and conflict. Either the selectivity at screening is poor, or an Antarctic winter has a unique potential for creating alcoholics.

Management of pathology: Careful reading of the literature concerning Antarctica leads to an opinion that psychological disorders are common there, and that some disorders are quite severe. The wish to see the psychological screening program as successful probably led to an undue emphasis on the fact that winterover has not been disrupted by recurrence of totally disorganized or violent behavior, and a relative failure to examine the ways in which the stations managed the individual or group pathology that did occur.

The communities in the Antarctic contained environment are, in fact, very resilient and capable of adjusting to marked abnormality. Individual case reports emphasize how important social and psychological isolation are for managing abnormality, despite the relative unavailability of physical isolation in the contained environment. One management technique, and one dear to the military, that is not available is significant disciplinary action. Under the conditions of the contained environment the community sees almost every function and privilege as being life-supporting, and any significant withdrawal, even of recreational opportunities, is interpreted by the community as an unreasonable punishment (Blair and Gavin 1984).

The medical personnel assigned to Antarctic stations are not skilled in management of psychiatric illness, and their interventions have not been particularly helpful in managing psychiatric casualties (Blair and Gavin 1984; McCullah 1977).

Prevention of pathology: In Antarctica, where illness may be fatally disruptive and where treatment facilities are minimal, primary prevention is essential. Screening of personnel was of considerable help. There was good correlation between individual adjustment and screening criteria (Gunderson 1974). When the recommendations of the screening team were not followed, and "disqualified" personnel were sent to winterover, a uniquely high level of group conflict was observed (Ronne 1961).

The importance of having productive work that is part of the community effort is clear. Radio operators and medical personnel are particularly at risk for development of emotional and motivational problems. The former appear to be at risk because they are isolated from other members of the station, and the hospital corpsmen because they have little to do.

Emotional symptomatology tends to increase during winter in those Navy personnel who feel a reduction in usefulness, while civilians, whose scores for usefulness do not change, have relatively little emotional symptomatology. One difference between these groups is that the Navy personnel expect to get their satisfactions immediately

from approval of associates and supervisors and from results of examinations and other tests, while the scientists expect to gain their satisfactions from their research only after a long delay (Gunderson 1968). Changes in task demands profoundly change the individual's perception of his usefulness, his job satisfaction, and the group's esteem (Gunderson 1969).

The importance of work in relation to emotional disturbance is also seen in populations outside Antarctica, where susceptibility is importantly related to personal needs, occupational roles, and environmental stresses (Gunderson and Arthur 1966).

Physiology

Because psychological well-being is so intimately interrelated physiological well-being, it is well to consider that physiological changes take place during winterover. Most of these can be attributed to exposure to dark and cold, but some are related to inactivity. The early studies were somewhat crude, and were done under conditions more severe than those characteristic with more modern environmental control (Wilson 1965). More recent work has studied both individual reactions and a wide range of environmental and hygiene problems (Pierce 1982). Of the more recent work, the relationship between light and mood disorder has gained deserved attention (Hellekson et al 1986). The more generalized reactions to conditions of stress, and especially the endocrine reactions, are well known (Gray 1971; Rose 1980), and are being studied both in Antarctica and in laboratories that simulate the Antarctic climate (S. Lewis, personal communication). Russian studies of the Antarctic Environment have tended to emphasize a multifactor analysis of the problems of adjustment to Antarctica, and typically include discussions of environment, physiological changes, sanitation and nutrition (Matusov 1962).

Appetite: Food and eating are tremendously important in Antarctica. Food seems to be a compensation for other deprivations, and weight gain is usual (Holmes-Johnson 1985; Mullin and Connery 1959; Law 1960). When a cook fails to function adequately it is a major crisis (McCullah 1977). The repeated mention of food as important to morale in Antarctica reminds one of Napoleon's dictum about an army traveling on its stomach, or of the British Navy's custom of feeding the crew an extra meal when a battle is expected. Similarly, food has been recognized as central to rehabilitation when psychiatric casualties are to be returned to duty.

Circadian rhythms: In the artificial environment of the contained environment daily rhythms become disrupted, but it is not clear how much of this is disruption of circadian patterns by changes in light and temperature cycles, and how much is a result of boredom, lack of physical exercise, and individual attempts to gain isolation from the group. Whatever the cause, failure to adhere to the work rhythm of the group can be very damaging to group cohesion and morale (Law 1960). The insomnia that is a frequent complaint during winterover is probably based at least in part on lack of exercise. Those who were least active had more insomnia, and the complaint disappeared during summer when extensive outside activity was possible (Mullin and Connery 1959).

Return to the outside world

The population in a contained environment lives with the expectation that they will at some definite time return to the world at large. There is an accompanying set of expectations concerning what the outside world will be like. Those who have wintered-over in Antarctica feel that they have done something outstanding, and feel entitled to recognition for their accomplishments. Hunger for recognition and praise are prominent while the men are in isolation, and does not abate when they return. This

hunger is rarely satisfied. Return to the outside world can be particularly difficult for the individual who went to Antarctica to escape that world, who made a good adjustment in Antarctica, and hoped to return with an improved ability to cope. These men are often disappointed (Law 1960).

Aftermath

Although little published data is available, there exists a widespread opinion among those who have studied the Antarctic that there are long-term pathological changes in some who have experienced this environment (Matusov 1962). Anecdotes about severe depressions, insomnia that does not resolve for years, amotivational states, and general inability to readjust are common in any meeting of OAE's (Old Antarctic Explorers). Many personnel who had no known drinking problems at the beginning of winterover become problem drinkers by the end (Blair 1983).

Those who are selected to winterover are selected from a group that is highly trained and qualified. During winterover they gain valuable additional experience. It is remarkable that of the many thousands who have gone to winterover, only a few have achieved prominence for their accomplishments in later life.

SYNTHESIS OF AVAILABLE INFORMATION ABOUT ANTARCTICA

If you want a successful winterover in Antarctica you will:

* Select personnel who are interested mainly in doing their jobs well, who are comfortable in conventional social situations, and who do not get excited over trivial matters.

* Give them a leader who will leave them alone to do their work, but will organize group activity when needed.

* Let your group get acquainted before they are isolated.

* Let the work situation structure the group.

* Give them as much privacy as possible.

* Work them hard.

* Feed them well.

A DESCRIPTION OF THE SCPS-M UNIT

The Survivable Collective Protection System-Medical is a contained environment to protect medical personnel and patients during chemical warfare. It contains air locks for entry and exit, spaces for decontamination of entering patients, and spaces for triage, medical treatment and berthing of patients. There are spaces for the machinery that

maintains a livable internal milieu. The habitable spaces will be very cramped for the crew of about 10 medical personnel and for the patients, who will be present in varying numbers with a maximum around 100. Staff and patients will be active duty military. The unit will be in voice contact with other (non-medical) protection shelters and with individuals in protective clothing outside the shelters. The unit will be occupied for up to 96 hours continuously, or up to 30 days on an intermittent basis.

THE SCPS-M UNIT AS A CONTAINED ENVIRONMENT

The SCPS-M Unit will have some similarities to an Antarctic winterover station. Both are contained environments which share these characteristics: they protect from hostile environments, ingress and egress are difficult and dangerous, they are cramped and allow their occupants little opportunity to be alone or to have usual recreational or social activities. For both life support requires mechanical processing of air supplies, and lighting is artificial. Both have a measure of sensory deprivation, where sensory input will be limited in range and variation, and where motor activity will be, at least for most of the inhabitants, limited and unvarying.

The SCPS-M Unit will also differ from the Antarctic winterover station in some significant ways. It will be occupied for a relatively short time. It will have two separate and distinct populations living side by side. One of these populations, the medical staff of the Unit, is in most ways comparable to the population of a winterover station. The personnel will be in their workplace, and have a group structure imposed by the work they have to do. The second population, the patient population, is not known in Antarctic winterover, where it was necessary that the station support only individuals who had a defined work role.

TABLE I makes some comparisons between the SCPS-M Unit and the Antarctic winterover station.

In the following discussion we shall largely ignore the problems of the patients, and make few special recommendations concerning them. To a first approximation the first 96 hours for a casualty in a contained environment will not differ materially from the first 96 hours in another treatment facility unless the level of care available is different. At the time of this review the level of care available in the SCPS-M Unit has not been defined, and we can only note that when level of care is defined any deviation from usual practice will require appropriate planning.

For the patients the stressors will include enforced passivity, confined physical spaces, and total lack of activities for those patients who are alert. These stressors for patients are common to most military primary treatment facilities, but may be somewhat worse in the SCPS-M Unit.

For the staff the stressors in the SCPS-M Unit will include intense repetitive physical work, intimate contact with the wounded, dead and dying, the necessity for decisions that imply life or death, and limited resources to support their medical skills so that they will not be fully effective in their work. That these are not trivial stresses is well known (Shea 1983), but seldom said out loud. During rest periods the staff will have little quiet and privacy, and very little opportunity for alternate activities if they are not at work and not able to sleep.

RECOMMENDATIONS FOR DESIGN AND USE OF SCPS-M UNIT

Physical design

Physical design of the SCPS-M unit is a practical problem in Environmental Psychology, but is a problem of more than ordinary difficulty because of many extraordinary features of this contained environment and of its inhabitants. We shall discuss only a few of the usual categories and issues that are the proper concern of Environmental Psychology (Gifford 1987).

Private space: In the midst of the crowding and commonality of the contained environment, it will be well to identify some private space, however small and inadequate, for every inhabitant. For the crew members this might be a drawer or box at their workstation where their personal effects or particular tools are kept. As much as is possible consistent with maintaining needed flexibility of function, each worker should be encouraged to feel that his workplace and his place on the working team are uniquely his own, at least during his duty hours.

Workspaces: Because work roles are the dominant structuring force in the contained environment, design should permit clear definition of work spaces by the use of such techniques as delimiting arrangement of equipment and wall colors.

Environmental stimuli: To provide changing environmental stimuli there should be variation of light levels, wall colors, decoration, sound levels, and activity levels as one moves through the unit. Multiuse area will undoubtedly be necessary, but all areas should be given as much individual character as possible.

Eating and recreational spaces: If possible a designated space for eating, and for whatever recreation is available, should be provided. This might be a space that was available only until patient load was near maximum, at which time it would be converted to patient berths.

Selection of personnel

Although it cannot be quantitated, there seems to be little doubt that the screening of personnel for Antarctic duty has an impact both on individuals and on the group. At very least it makes the candidates conscious that Antarctica is a special place, and that there are special human requirements for successful Antarctic adjustment.

A screening of crew personnel prior to exercises, and in anticipation of actual use of the SCPS-M Unit would be desirable both as a research and training procedure. The criteria for the screening are not immediately clear, but some at least can be imported from the Antarctic experience. Work orientation, group compatibility and low emotional reactivity are generic requirements that recommend themselves immediately. In screening for the Antarctic the group leader was of necessity screened at the same time as his personnel. With the SCPS-M Unit there is an opportunity for an innovation, that is, involvement of the leader in the selection of his crew. The pros and cons of possible involvement of the leader in screening have been informally discussed in the course of training screeners for Antarctica. On the one hand the leader would gain a more intimate understanding of the men with whom he would be working, on the other it is possible that a leader might be tenacious in undeserved loyalty to personnel he had himself chosen and placed in positions of responsibility. Because there will be several exercises and training evolutions with the SCPS-M Unit there will be an opportunity to actually examine some of these possibilities.

Training and preparation of personnel

The two populations who will inhabit the SCPS-M Unit, the staff and the patients, require differing training and preparation. For the staff we can consider specific training, for the patients, because this group consists potentially of the entire population of the base, we can consider only preparedness.

In the Antarctic experience, preparation for winterover in the contained environment consisted of two parts, first the selection process by which personnel were acquainted with the nature of the coming experience, and secondly the summer in Antarctica which introduced them to at least some of the features of the contained environment. For the SCPS-M Unit exercises will take the place of the summer get-acquainted period. To optimize eventual performance the crew or crews should work together consistently in practice so a measure of group cohesion can form, and so that intra-group conflicts can be observed and resolved.

For the patients, entry into the SCPS-M unit through the decontamination area will be stressful, and will be an experience that is not usual in casualty care. Every potential patient should know what decontamination might be like, and as many potential patients as possible should experience decontamination during exercises.

Use of the SCPS-M Unit for housing of non-medical and non-patient personnel should be avoided. The problems of creating a suitable environment for off-duty personnel (the SCPS-II Unit), are in some ways similar to those for the SCPS-M Unit, but should be given due separate consideration.

Internal command structure

The Antarctic experience emphasizes that in a contained environment the command structure is of great importance, and that the selection of the leader is crucial. The command structure and power in many Antarctic stations is ambiguous, and this has caused difficulties there. In the SCPS-M Unit, where all the inhabitants are military, there will at least be an opportunity for a simple and unambiguous command structure, but the leader must still learn to combine a willingness to listen to advice with firmness in decision. If a work-oriented crew is selected, as would be desirable, the leader will also need to learn the Antarctic virtue of allowing the crew maximum independence, interfering only when he was needed to organize group efforts.

Communications with exterior

It is essential that the locus of control for any particular type of decision be exactly defined before the contained environment is physically separated from the outside world. The inhabitants of a contained environment rapidly come to believe that the exterior world does not understand their situation, and that the exterior authority is forcing adverse decisions upon them. As much control as possible should be left in the contained environment, and the external authority should be prepared, in order to maintain locus of control inside the SCPS-M Unit, to tolerate, in non-crucial matters, what appears to them to be poor judgment. Under actual chemical warfare conditions there may be no difficulty in maintaining locus of control in the SCPS-M Unit, for the rest of the base will probably be busy with its own problems.

Conduct of exercises

Exercises of the SCPS-M Unit have much to teach us. The SCPS-M Unit differs from most other contained environments that have been studied in detail in that it will contain two distinct populations, a staff who views it as their work-place, and a transient population for whom is it primarily a shelter and a place where they receive care. A proper exercise for the SCPS-M Unit will test what is optimal for each group and will reach rational decisions when the needs of the two groups differ.

It is essential that the level of treatment in the SCPS-M Unit be clearly defined. In any exercise evacuation policy must be clearly defined. The work of the unit is central to the function of the unit, and if the exercise does not plausibly duplicate the work it will fail to test the function of the unit.

All exercises must be realistic in all details. This may appear to be a matter of course, but it will be difficult to achieve. The isolation, social closeness, poverty of stimuli, and limitation of activity that will characterize actual use must be achieved during exercises, and for as long a duration as actual use is anticipated. The dirt, sweat, fatigue, boredom, noise and smell should not be ameliorated.

The SCPS-M Unit should be exercised as part of an exercise of the entire base, so that any problems with communications between the contained environment and the outside (commonly seen in Antarctica) can be detected and corrective measures implemented.

Management of problems

Of the problems that arise during Antarctic winterover, one can expect some to arise also in the SCPS-M unit. The situation will be complicated in the SCPS-M Unit because anticipated periods of high work load will cause fatigue of a severity unusual in Antarctica.

The measures suggested below to aid in managing arising problems will be very difficult to implement. The instinctive view of military command is that the crew ought to be able to manage a day or two or three or four of intense combat without special preparation or arrangements for rest and recreation. Military command is probably correct in this view, and the SCPS-M will probably do its work and show no obvious casualties among the crew even if nothing were done to optimize conditions there. Many improvements in the unit can, however, be achieved at minimal cost. It is likely that efforts on the part of command to improve life and function in the Unit will do much to convince personnel that the Unit is intended to be survivable, and not simply a mass grave.

Insomnia: The chronic insomnia of Antarctica seems to trouble the insomniacs very little (Blair and Gavin 1984), but is very disrupting to would-be sleepers if the insomniacs adopt eccentric sleep patterns. Sleep in the SCPS-M Unit will be difficult for easily understood reasons (noise, excitement, physical discomfort) and lack of sleep will be subjectively distressing to the crew and will contribute to degradation of performance. It has been shown that sleep patterns in shiftworkers can be managed, even under unusual environmental conditions (Anderson et al 1984), and there should be an energetic attempt to promote reasonable sleep patterns in the SCPS-M Unit. Helpful manipulations may include practice during realistic exercise, adherence to shift schedules, time to "wind down" before sleep is attempted, eating before sleeping, and sleeping quarters that are as comfortable and quiet as possible. Quality of sleep (lots of stage IV) will probably be more important than duration of sleep. In the 96 hours of continuous operation now anticipated REM deprivation is not likely to be a serious problem.

Cognitive disturbances: In merely two hours of sensory deprivation susceptible individuals can have marked changes in perceptions (Lilly 1956). Ninety-six hours spent by highly stressed, fatigued and sleep deprived crewmen in the SCPS-M Unit are likely to produce some significant cognitive defects. To prevent these defects, and the defects in situational judgment and interpersonal skills that accompany them, it will be well to provide the maximum available in variation in stimuli and activity levels. If rest periods are longer than the crew can utilize for restful sleep (eight hours maximum), an alternate but non-demanding and non-fatiguing activity should be provided. Experience in Antarctica shows that videotapes are an excellent activity for individuals in contained environment. Videotape equipment takes minimal space and can be used by many at once. If earphones are used the sound is not disturbing to non-viewers. The tapes are likely to be acceptable diversions for almost everyone in the crew. They require very little in the way of intellectual application and supply diverse visual and auditory stimulus input. In Antarctica it seems to matter little that the same films are shown over and over again (Law 1960). It is quite possible that the familiarity and predictability of the tapes are positive virtues. Mealtimes should be made as social and ceremonial as possible. The food should be as varied and as appetizing as possible and served hot or cold as appropriate. A mild physical exercise program (e.g., stretching exercises) for off-duty personnel is likely to be helpful.

It is usual in military medicine to find periods of intense activity interspersed with times when there is literally nothing to do. The Antarctic experience has shown how important useful work is to maintenance of morale and self esteem, and idle periods should have as much planning as periods of intense work. Probably the best possible arrangement is to have available a range of work activities that are useful but not essential (although "busy work" should be avoided (McCullah 1977)), and supervisors that are trained to keep everyone busy during work hours. Idle work hours should not be used for non-work activities. Rest and recreation during idle duty hours would contribute to loss of the much needed structure gained by scheduling of work-play-rest within the contained environment.

Substance abuse: Alcohol abuse in Antarctica is often interpreted as an "escape" from the tedium of the contained environment. The SCPS-M Unit, for all its discomforts, is not likely to be experienced by its inhabitants as a place to be escaped; on the contrary, some who enter the SCPS-M unit will not want to exit to meet the hostile environment again. Because triage of personnel in protective garments is exceedingly difficult, it is likely that errors will be made, and some patients will be taken in who are not in need of care. During the time they are in the SCPS-M Unit they will be reduced to complete passivity in a patient role--the worst possible preparation for returning to combat. Each of these individuals will be given his antidote syrettes when he is to return to combat, and will have the means to temporarily disable himself. It will be well to anticipate and plan for the possibility that the syrettes will be abused to prolong stay in the unit, or to gain re-admission.

To promote return of able personnel to work, the familiar principles of battlefield psychiatry (Small 1984) should be followed in exercises and eventually in actual use of the unit, even though the casualties are not, strictly speaking, psychiatric casualties. It may of course, happen that the conditions of chemical warfare will result in psychiatric casualties earlier in battle that is ordinarily expected, and significant numbers of psychiatric casualties will enter the unit. As soon as it is recognized that the personnel are physically fit they should be removed from bed-patient status, given food and a chance to attend to personal hygiene, allowed to talk about what has happened to them, and assured of their ability to return to duty. The SCPS-M Unit should allow sufficient space to accomplish this work. Actual return to duty should be as prompt as possible.

Debriefing

Debriefing has a dual purpose: not only does it provide information for researchers and planners, but it also serves a purpose in preventing after-effects in people who have been subjected to traumatic events. The SCPS-M Unit, operating under real-life conditions or even under realistic exercise conditions, will be a severe stressor for the occupants, and plans should be made for suitable debriefing. Trained personnel are necessary, but the training is not difficult (Farberow 1979). Certainly debriefing, with the double intent of research and of prevention of after-effects, should be part of every exercise.

RECOMMENDATIONS FOR FURTHER RESEARCH

We are probably near knowing most of what can be reduced to systematic knowledge about the way individuals and fairly homogeneous groups adjust to contained environment. We have much to learn about long-term adverse effects of experience in contained environment, and about ways to reduce short and long-term adverse effects of life in contained environment. Psychological research studies of the SCPS-M should concentrate on understanding adverse effects, and of ways to reduce them. The multifactor integrated biological-psychological-social approach of Soviet workers has much to recommend it. They carefully consider dietary, hygienic, recreational and social factors, and recommend such measures as control of monotony by active recreation, rational distribution of working hours, and insisting on a daily schedule (Matusov 1962). Sleep research in the SCPS-M Unit should have high priority. There should be active attempts to promote drug-free sleep, and careful evaluation of results. For those who must function in adverse environments restful sleep is of tremendous importance, great practical rewards will accrue if it can be promoted.

For all those interested in contained environments, study of the SCPS-M Unit will be particularly important because the SCPS-M will contain two populations, the one that does the work of the contained environment, the other that simply lives there and is cared for by the workers, and is totally without occupation or recreation. A similar situation in other contained environment is probably far distant--it will probably be a long time before, for instance, a space vehicle functions as an airliner to Mars--but the crew-passenger split is inevitable as the capacity of space vehicles increases and more very specialized scientists are taken into space to perform a narrowly defined set of activities.

SUMMARY

In planning for use of the SCPS-M contained environment, the useful lessons to be learned from Antarctic experience concern selection of leaders and other personnel, configuration of the group's working and personal spaces, provision of useful work or of alternates to work, and attention to feeding and sleep of personnel.

It will be well to select a crew that is primarily interested in work, and minimally abrasive socially, and a leader who lets the crew work but who organizes group activity when needed. Leader and crew should train together. The necessities of the unit's work should be allowed to provide structure to the group, and the work space should, as much as possible, be allowed to be each crewman's personal space. If workload is not high a

familiar audiovisual diversion should be provided. Optimal possible arrangements for sleep should be made. Adequate food, if possible hot and appetizing, should be provided.

TABLE I

A COMPARISON OF TWO CONTAINED ENVIRONMENTS ANTARCTICA AND THE SCPS-M UNIT

ANTARCTICA	SCPS-M
POPULATION	
Volunteers Selected 20 in small stations 200 in largest station	Assigned Unselected About 100
SUBPOPULATIONS	
Two or three: -Navy support staff -Civilian scientists -Civilian support staff	Two: -Medical staff -Patients
DURATION OF STAY	
Seven months	Days for medical staff, hours to days for patients
POSSIBILITY OF LEAVING	
Virtually impossible	With protective gear can go to another contained environment
OUTSIDE FRIENDLY ENVIRONMENT	
Interested and friendly Supportive	Busy with own problems
COMMUNICATIONS WITH OUTSIDE	
Frequent, recreational Interactive	Sparse, business only

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TREATING THE CHERNOBYL VICTIMS:

INDIVIDUAL AND GROUP RESPONSE OF THE UCLA MEDICAL TEAM

Richard Champlin, M.D.

Debriefing of Dr. Champlin, Chief of the Bone Marrow Transplant Service, following the Chernobyl incident.

15 October 1986

DR. FULLERTON: Starting from the beginning, I would like you to describe your involvement with the Chernobyl incident. How were you first contacted?

DR. CHAMPLIN: I heard about the Chernobyl accident on the radio several days after it happened. Dr. Gale, who is an Associate Professor here, contacted the Soviet officials with the help of Armond Hammer to assist with the victims, particularly those who might need bone marrow transplants. Dr. Gale went there by himself. Two days later he informed me that the Soviets would accept both myself and two other physicians to assist in the operations.

DR. FULLERTON: At the point you were informed that you would be accepted, what did you know about what had happened?

DR. CHAMPLIN: We knew almost nothing. We had no idea as to how much radiation was emitted, how many victims there were, or how seriously the casualties were. We expected from the descriptions in the disclosure that there might well be a large number of people who received large doses of radiation and would need bone marrow transplants.

DR. FULLERTON: As far as your initial reaction after learning that you would be going over, what went through your head regarding the possibility of contamination?

DR. CHAMPLIN: We went to Moscow, not to Chernobyl itself. Since the wind was blowing in the other direction, Moscow seemed to be a safe place. I did not realize until I returned to the U.S. that there were continuous radiation emissions for one week following the disaster. There was a high level of radiation around Chernobyl. I learned of this when full disclosure was made about the accident.

DR. FULLERTON: What sort of reaction did your family have regarding your participation?

DR. CHAMPLIN: They were concerned. I did not think there was much risk for myself considering that I was not going to the radioactive zone. They were more concerned that I was going to the Soviet Union and there was uncertainty because of the Daniloff case. I had never been to the Soviet Union.

DR. FULLERTON: When you went to Moscow were you accompanied by other members of the UCLA team?

DR. CHAMPLIN: I went over with Dr. Terasaki of UCLA, and Dr. Reisner from Israel arrived the following day. That made a total of four of us including Dr. Gale.

DR. FULLERTON: Were there any technicians accompanying you?

DR. CHAMPLIN: We wanted to bring some technicians to help us, but the Soviets would not allow any additional people to come.

DR. FULLERTON: So, it was just the four of you?

DR. CHAMPLIN: Yes, we did everything there ourselves. Dr. Terisaki did most of the tissue typing himself, with the assistance of one of the Soviet physicians. Dr. Reisner was assisted by a Soviet physician in performing the bone marrow processing, which is needed before the transplant. Dr. Gale and I assisted in the clinical care of the patients. We actually performed some of the transplants with the Soviet physicians. We were there to assist the Soviet doctors and did not take over the care of any of the patients.

DR. FULLERTON: Did the UCLA team stay together?

DR. CHAMPLIN: We stayed in Moscow in the same hotel.

DR. FULLERTON: Was there much interchange of feelings or thoughts about what you were experiencing, either on a personal or medical level?

DR. CHAMPLIN: There was a combination of the two. All of us had been through many professional experiences and were reasonably experienced in dealing with new problems. This was an undefined problem that had never occurred before. We talked among ourselves extensively about how we should approach the care of the patients.

The other interchange involved the Soviets and our dealing with them and the press. We discussed whether we should try to spend a great deal of time educating the Soviet physicians, as opposed to stepping in and actually directing the care of the patients. We felt that the best approach was to pass along whatever information we could in teaching the Soviet doctors who were responsible for these people after we left. Also, we wanted to help them in the future in dealing with other types of patients.

DR. FULLERTON: Was there much press attention given to the Americans there?

DR. CHAMPLIN: Yes, it was a heavy news item every night for months. We tried to keep a relatively low profile. We did not want to get caught up in the political controversies between the governments that related to this issue. We wanted to maintain a good working relationship with the Soviets and also with the doctors we were dealing with. We tried not to get involved in the press sensationalism.

DR. FULLERTON: In dealing with any tension or anxiety surrounding the situation, was there much joking or relaxed interchange between the team members?

DR. CHAMPLIN: There is always a degree of black humor in medicine to relieve the tension.

DR. FULLERTON: Did you or any of the other team members experience any worries about contamination, or any fears that felt unreasonable?

DR. CHAMPLIN: I think that none of us felt concerned that we would become contaminated ourselves. While we were in Moscow, the patients were carefully checked for radiation. We were checked everyday going out of the hospital for radiation on any of our clothing. The patients by virtue of inhaling radioactive gases were a little radioactive themselves, but not enough that they would be a risk to the health care personnel. Their body fluids contained some radiation. Hospital staff had to be very careful with cleaning their rooms and taking care of their blood samples. There was a great deal of appropriate concern in monitoring radiation levels around the patients. It was not high enough, however, for personnel to be concerned about their own safety.

DR. FULLERTON: How were you checked for radiation?

DR. CHAMPLIN: They used a geiger gun to check our shoes and hands when we left the hospital each day. We wore a gown wherever we went in to see the patients.

DR. FULLERTON: What specifically did you and Dr. Gale do?

DR. CHAMPLIN: I am in charge of our bone marrow transplant program at UCLA and we reviewed, with the Soviet doctors, the medical status of the patients and tried to determine who should receive what sort of treatment, including bone marrow transplants. We assisted the Soviet physicians in performing many of the actual transplants.

The Soviets did nine transplants before I arrived. They knew what to do in general, but had limited experience. They had conducted only 20 transplants prior to the accident. We had done more than 500 and were more experienced with the transplant itself and the problems relating to it. That is the expertise we offered them. In addition, they had a severe shortage of supplies, drugs, machinery, and equipment necessary to perform blood transfusions such as platelet transfusions. We were able to secure some of this equipment from various companies that generously donated them to the Soviet Union. This included two cell separators to provide platelet transfusions and a blood cell counter which is necessary to check the blood test.

They had a small hospital that normally accommodates three transplant patients. They had 35 people who were severely affected that we considered for transplants. Nineteen ultimately received bone marrow transplants. We felt the other sixteen did not need transplants. We felt they would get better on their own if they could be supported.

DR. FULLERTON: These were decisions made by Dr. Gale and yourself?

DR. CHAMPLIN: They were made by myself, Dr. Gale, Dr. Boranoff who is a Soviet physician, and Dr. Discova who is the head Soviet physician. The hospital made decisions as a group and we came to a consensus.

DR. FULLERTON: So, there were 35 severe casualties at that hospital?

DR. CHAMPLIN: Yes. There were 300 total casualties related to this accident who were hospitalized in Moscow. Only 35 had high enough doses of radiation to affect their blood counts to the point that we needed to consider a bone marrow transplant.

DR. FULLERTON: So, these were the patients that you were dealing with?

DR. CHAMPLIN: Yes.

DR. FULLERTON: As far as the reactions of these patients that you had contact with, can you remember the response of the people themselves to the injury?

DR. CHAMPLIN: It is hard for me to know many details about this because the patients did not speak English and I did not speak Russian. We spoke through the doctors that were dealing with the patients and the members of administrative health who translated for us. They were very sick and not able to talk about it. I did not get any insight into their feelings.

Some of the patients were quite mixed in the degree of infection they suffered. Some patients had only bone marrow suppression and did not have any skin burns or other symptoms related to their radiation exposure. They were somewhat puzzled because they could not understand the true nature of their illness. They felt well, looked okay, but they did not have white blood cells or red blood cells being produced and hence were extremely susceptible to infection. Many of them, not being sophisticated in medical matters, had difficulty understanding what was happening and were confused. One refused to have a bone marrow transplant because he felt fine and did not think he needed to go through that type of procedure. That was his right so he did not get one. Other patients were extremely ill and had skin burns related to the fire and radiation within the building and had severe internal injuries as well. They also had third degree skin burns over their entire body. They were in severe pain and agony and were lying in bed groaning and delirious from their physical manifestations. Most of them died within a week from these injuries, and probably were lucky they did not suffer longer. I could not envision a person sicker than these victims because their whole body was affected by the radiation.

DR. FULLERTON: How many were severely affected?

DR. CHAMPLIN: There were approximately 12 people. Of the group we did bone marrow transplants on, about that number died from the effects of radiation on other tissues and the bone marrow transplant never had a chance to help them. They died from skin burns and gastrointestinal effects of the radiation suffering from severe diarrahea and bacterial infections. Normally, infections that get into the intestines get there through the blood stream when the membranes have broken down. Those people could not be saved despite the maximum effort.

DR. FULLERTON: In evaluating the people who the team felt could benefit from the bone marrow transplant, how difficult was it to tell the ones that would not survive?

DR. CHAMPLIN: That is the difficult part of it because there was no direct measurement of the dose of radiation anyone was exposed to. We had to estimate that based upon the biologic effects of how fast their blood counts fell and how many chromosome abnormalities we could detect in the blood. We also checked their signs and symptoms in other tissues. One thing that would predict whether a patient would die is if they had severe injury to their skin and intestines, which was evidenced by skin burns and diarrahea. Those patients almost always died within one to two weeks from the radiation.

DR. FULLERTON: You could predict this?

DR. CHAMPLIN: In retrospect, because up to this point there had not been enough victims of radiation that one could not make any firm statements. This stands to reason that people who are affected in the beginning are going to get worse. Radiation

does not have its full affect in terms of producing tissue damage for about two weeks after the radiation becomes present. Those people who got worse over the two weeks instead of better would be at the highest risk of dying of complications.

The bigger question was who really needed a bone marrow transplant to recover and who would get better on their own. This continues to be a controversial area.

There is not any one dose of radiation that will preclude you from having your own bone marrow grow back. It is estimated that people who get more than five hundred grams of radiation would at least have more that a 50/50 chance of dying from the effects of the radiation suppressing the bone marrow. Those patients got bone marrow transplants hoping that we could improve those results. Unfortunately, most of the patients did not have a perfectly matched donor. Only six or seven of the patients got a matched transplant. Another six or seven patients had mismatched transplants from their parents and that was half matched. Six patients received fetal liver cells which are a source of blood forming cells in the developing fetus. Severe patients who did not get a transplant received the phible liver cells. These cells were obtained outside of the hospital from still borns or other people.

Of the 19 people who got transplants, all died of complications of the radiation to other tissues. Of the 13 bone marrow transplants, only two are alive. Most died of the effects of the radiation on other tissues and others had infections or rejection of the transplant that contributed to their death. It is a complicated area.

DR. FULLERTON: At what point in time are transplants done?

DR. CHAMPLIN: We tried to do them as soon as possible. It took four days to evaluate the patients and to decide who would be recipients. During the next week the transplants were performed. The idea was to do it as soon as possible so that people would not be at risk for developing infections due to low blood counts. If we waited until they became critical, we would still have to wait three weeks for the transplant. That would be waiting too long, so we tried to intervene as soon as we could.

DR. FULLERTON: How long does it take to complete the procedure?

DR. CHAMPLIN: It takes one hour. A transplant itself is not technically very demanding. The hardest part is supporting the patient after the transplant and keeping them alive until their immune system can recover following the regeneration of the new cells from the bone marrow. It takes at least one month to have some recovery and blood production. The system does not really get back to normal for one year after the transplant. It is a complicated area, but within one month the recipient of a successful transplant will benefit.

DR. FULLERTON: How long were you in Moscow?

DR. CHAMPLIN: A little more than two weeks.

DR. FULLERTON: Have you been back?

DR. CHAMPLIN: No, I have not. I spoke to the Soviet doctors on the telephone, and they have visited us. Dr. Gale has returned on a couple of occasions.

DR. FULLERTON: What are your thoughts about going back?

DR. CHAPLAIN: There is no specific reason for me to go back now. I have seen Russia and they were nice to me, but it is not a place I would go to for a good time.

DR. FULLERTON: Did you have an opportunity to do non-work related activities while you were there?

DR. CHAMPLIN: We were working very hard, particularly the first week we were there. The second week after we finished the transplants we had more free time. We went to the Bolshoi ballet, a Scrim concert, and saw many museums. They took us to Leningrad for one day. There is an overnight train that goes to Lenningrad. We saw some of the tourist attractions while we were there. The Soviet officials that we dealt with were very polite to us. They tried to show us every courtesy.

DR. FULLERTON: Do you feel that getting away from the main work was beneficial in ways other than just being interesting?

DR. CHAMPLIN: Yes, it was. One can get a sense of deprivation if all there is to do is work. The problem for most of us was jet lag. Because of the time difference from Los Angeles to Moscow we found ourselves working all day and into the night. We got to bed at midnight only to wake up at 2:00 a.m. We were exhausted the next day. I was unable to sleep through the whole night. The conditions in Russia are pretty stark. They have clothes, food, and not much more than the bare necessities of life. There is not much variation in the country. We ate in the same places everyday and had the same food. The menu did not change in our hotel. The menu there and in other places in Russia is very much the same. There is no real incentive to do anything different or better than everybody else does. Everything is monotonous.

DR. FULLERTON: Was the food good?

DR. CHAMPLIN: It was okay. It was not great or terrible.

DR. FULLERTON: What sort of things do they eat?

DR. CHAMPLIN: Borsch, chicken, and meat with their own seasonings. In general it was bland.

DR. FULLERTON: Was there much alcohol consumption among the people involved with the disaster victims?

DR. CHAMPLIN: They were having an anti-alcoholism campaign in Russia because they have had a major problem with alcoholism over the years. It was difficult to get anything to drink at our hotel. We had Armond Hammer bring us some beer on the airplane when they came. We would have a beer at night after we were finished working.

DR. FULLERTON: How did you deal with the difficulty sleeping?

DR. CHAMPLIN: I would have brought sleeping pills. We left at a moments notice when we were approved to go and I did not have a chance to get myself as organized as I could have.

DR. FULLERTON: When you felt exhausted or overwhelmed did you feel the need to get some distance?

DR. CHAMPLIN: Not really since we were excited to be part of this new and unexplored area. From that standpoint we were willing to put in the time it took to get things done. During the course of medical training, a student can be on call 36 hours

continually, so we are accustomed to long hours if we have to work them for a short time. None of the days were unbearable. None of us had emotional problems coping with keeping up when we felt tired. We were excited to be there and very impressed with how ill the patients were. We felt sorry for them. We empathized as much as possible with them. Fortunately from our personal standpoint, we were not in the room with the patients all of the time. We saw them once a day. The Soviet junior physicians and nurses were constantly with them trying to deal with the minute to minute problems and to act as consultants for overall evaluation, dealing with frequent planning. We had some distance from the ongoing pain and suffering.

DR. FULLERTON: Did that make it easier or harder?

DR. CHAMPLIN: I think it made it easier because it is harder if you are listening to the agony of the patients continually. From our position at a distance, we thought more of analyzing the medical situation in terms of what needs to be done and the strategy to help the patients. We were not overwhelmed by the pain and suffering of the patients themselves, which is certainly something we were aware of. We have tried to help them by providing comfort for patients with medication and having their families have access to them for emotional and physical support. That was the job that the Soviet physicians and nurses did themselves and we did not have to be particularly involved in that aspect.

DR. FULLERTON: Were family members present?

DR. CHAMPLIN: Yes, they were and they had to wear gowns and dresses from head to toe to prevent the patients from getting infections, and to protect themselves from radiation exposure. They were allowed in the patients' rooms.

DR. FULLERTON: You mentioned in the beginning that you did not have much information about the accident when you first went over.

DR. CHAMPLIN: When we were there for the two weeks we knew very little about what actually happened on the site of the reactor. Even though it was important for us to know, we did not know how much radiation was released or the circumstances of the explosion. Many of the fireman that went in to deal with the disaster after it occurred were not adequately protected from the radiation. They were not wearing lead clothing.

Basically, we were quite a bit in the dark. At the end of our trip there was a press conference and a more complete and open release of information was made by the Soviet officials. Our team was given the medical status of the patients and there was a joint news conference.

DR. FULLERTON: What were your thoughts about what it felt like not to have those details.

DR. CHAMPLIN: It was frustrating because there was not open access to information. There is no access to Western newspapers. The only news comes from the Russian news agency. They were trying to downplay the Chernobyl accident as much as possible. There was little information provided. Most of the Russian news was directed to the Libyan attack on the U.S. airplane which occurred about two weeks prior. There was major political controversy and much propaganda about the American's attack on Libya. They made a public stance that all they were concerned about was trying to change the attention of the world to some other matter after Libya. This was the politi-

cal atmosphere with that type of controversy. We did not have any concrete information ourselves. Realistically, there was not much available.

We knew less than the people outside of Russia. What news we got was from reporters who had access to the international news wire. They told us things and they asked us questions. They were American and Western European reporters who were stationed in Moscow. They showed us the New York Times. We saw the computer written stories from the wire, but not the published papers. We were very aware that there was tremendous interest. We called our families and they would let us know what the American press was covering.

It was very different in Russia. There was no open disclosure of information during that first two weeks. There was a publicized news conference and after that time there was more open discussion within Russia. I am not certain why there was any delay in that open discussion. It may have been that the Soviets were trying to evaluate the problem themselves. It took much longer to come to life there.

DR. FULLERTON: Thank you very much, Dr. Champlin, for a most interesting interview.

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PSYCHIATRIC CARE OF ACUTE STRESS REACTIONS TO MILITARY THREAT

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Beyond chemical intoxication and consequent physiological disarray, human reactions to chemical and biological warfare (CBW) threat resemble, in essence, those observed in traditional warfare. The following is a description of these "classical" forms.

1. DEFINITION AND OUTLINE

Combat stress reaction (CSR) is the prototype of psychological trauma. It is the immediate result of a failure to cope with combat stress. CSR is typically characterized by an acute and severe reduction in the subject's functional capacity and by a subjective experience of overwhelming anxiety and inescapable threat. The incidence of CSR in modern wars has been from 10% to 22% of the total number of physical injuries. It has a typical course, the knowledge of which lends itself to primary prevention, early detection and appropriate treatment. In 30% to 45% of the cases, CSR results in an incapacitating chronic syndrome: the post-traumatic stress disorder (PTSD). Specific attributes of the battle that contribute to CSR are well recognized and may, eventually, be reduced or prevented. Early and prompt therapeutic intervention is the condition *sine qua non* for success in the treatment of CSR. CSR sufferers respond better to treatment which is conducted near the front. Evacuation of CSR patients to the rear should, as much as possible, be avoided.

2. OVERVIEW

Extreme behavioral and emotional reactions to combat have been known for centuries. They can be divided into two groups: one is an immediate reaction to combat events (CSR) and the other is a prolonged condition that continues for a long time after the battle (PTSD or Stress Response Syndrome). The correlation between the two is not simple: CSR does not always lead to PTSD and, vice versa, PTSD can develop without being preceded by CSR (late onset PTSD). PTSD has been the subject of many descriptions and evaluations during the last decade - specifically with relation to its occurrence in post-Vietnam veterans. Acute CSR did not receive that amount of attention. As CSR is the condition that prevails on the battlefield, it is more appropriate to consider it in the framework of a manual on war and disaster.

During the twentieth century, CSR was successively named "**shell shock**" (World War I) - a term that emphasized a hypothetical role of the blast effect of shells; "**war neurosis**" (World War II) - a term that implied a causal role to intrapsychic conflicts activated by the situation of war; and "**battle fatigue**" or "**combat exhaustion,**" a term that was introduced, for administrative rather than professional reasons, during the second half of World War II, and relates to the pervasive role of exhaustion during prolonged operations.

The concept of **combat stress reaction** stems from the theory of stress. It refers to the effect of both physical and psychological pressures on the individual, emphasizes situational factors rather then psychological traits or liabilities, and assumes a phase of attrition before the onset of the acute syndrome. The theory of stress assumes, in addition, the presence of specific activity aimed at reducing the impact of external pressures (coping).

Coping includes all the ways by which a subject attempts to reduce personal distress, preserve psychological integrity, and pursue organized activity. It includes intrapsychic mechanisms (e.g., denial of danger, rationalization of suffering, control of emotions); external activities (e.g., reaching out for help, information and support); and complex internal and external dispositions (e.g., magic faith in a leader, passive surrender). Passive surrender which, in this context, means an inhibition of aggressive responses to external offenses, is one of the most typical strategies of coping with personal discomfort and distress in military setting.

Effective coping is evaluated by its efficacy in achieving the following four goals:

1. Relief of personal distress.
2. Maintenance of a sense of personal worth.
3. Conservation of the ability for rewarding social contacts.
4. Sustained capability to meet the requirements of the task.

CSR expresses itself as a dysfunction in the above-mentioned areas: (a) an increase in distress; (b) a subjective sense of inadequacy; loneliness and guilt; (c) social detachment and isolation; and (d) increasing difficulties in task accomplishment.

In addition, CSR includes a massive decrease in the subject's ability to adapt and regulate his behavior. This deficit manifests itself in decreased stimulus tolerance, inappropriate response to social clues and dysregulation of affect. The presence of "paradoxical reaction" is an example of this deficit: the subject, who seems indifferent to massive stimulation (i.e., shelling or shooting) may show strong and sudden reactions to minimal stimuli such as minor social frictions or minimal noises.

3. THE PATHOLOGY OF COMBAT STRESS REACTION (CSR)

3.1 Pathophysiology

The pathophysiology of CSR resembles a homeostatic system under excessive demands. In such a system, the acute failure is preceded by a phase of formal equilibrium and functional resilience that masks a progressive exhaustion of buffers and resources. Such a premonitory stress reaction is often present to some degree before the externalization of CSR - sometimes even before the onset of the combat.

Another point is the subjective nature of the **appraisal** of stressful situations. Beyond its similarity to a homeostatic system, the impact of a psychological stressor on the subject depends largely on the way in which it is perceived and evaluated (i.e., its **appraisal**). Similar situations can be very stressful for one person and much less so for another according to the way in which they are perceived and analyzed.

Appraisal has, in fact, two directions: one is the evaluation of the threat involved in the situation (primary appraisal) and the other is the evaluation of available resources (secondary appraisal). This process leads to a global evaluation made of **the chances of success in coping with the situation.** In extreme stress, this would result in an an overall "fight" or "flight" reaction (or, in modern terms - challenge versus avoidance).

The quality of appraisal depends on the integrity of the subject's cognitive function (i.e., his capacity to think clearly, concentrate, shift attention, scan possible alternatives, and plan in advance). These cognitive functions are largely dependent on the subject's state of arousal which, itself, depends on the existing physiological (e.g., dehydration, insomnia) and psychological distress. The result is the vicious circle of

stress, high arousal state, diminished cognitive resources and distorted evaluation of the situation.

The end result of this vicious circle can be a state in which even minor events related to the combat are appraised as conveying imminent, inescapable and intolerable threat against which no effective action can be conceived. This is the case of acute CSR.

If such a condition lasts for a long time (that is if the subject is left in a state of extreme fear and arousal) a **traumatic reappraisal** occurs, in which the entire coping capability of the subject is discredited. This results in the installation of stimulus avoidance (flight) as dominant and permanent response to stress. This is the case of prolonged CSR and the beginning of PTSD.

The process of traumatic reappraisal can take from few hours to several weeks. During this critical time an external intervention can reverse the process. Later on, one can expect only partial results. After six months, the resulting PTSD is a chronic condition.

Social support has a great role in reversing the process of traumatization. The soldier in war is, in fact, involved in a massive group activity on which depend all his resources (information, orientation, food, mode of activity, protection from threat, etc.). Group factors, therefore, have a cardinal role in modulating the level of external demands on the individual and that of his subjective appraisal and distress. Often one individual's appraisal, mode of coping and personal distress reflect those of his reference group.

Once CSR has started the same group factors, validating his self-value, accepting him as peer, and cutting short his isolation, etc., can support the individual in his attempts to reverse the process of traumatic reappraisal.

3.2 Etiological factors

In evaluating the etiology of CSR one should consider the characteristics of the agent and those of the host. CSR may start either after a unique, intensive and unpredictable event or may follow the progressive accumulation of pressure. Some conditions were shown to favor the development of CSR (Table 1). They include the intensity of the combat and the number of deaths and physical injuries, the unpredictability of a specific event, the lack of social support, lack of clarity of information, and forced passivity.

The role of the military unit as a buffer and protector from stress can hardly be overemphasized. Adequate training, high motivation, cohesiveness within the group (esprit de corps), and effective leadership are the best protectors of the individual against personal trauma.

Table 1: Risk Factors of CSR

1. Factors related to the conditions of combat
   - Intensity
   - Unpredictability of stressor
   - Lack of clarity in information
   - Failure of leadership, death or replacement of a leader
2. Psychological factors related to the subject's task
   - Isolation from the basic unit
   - A new soldier in a unit
   - Passive role (drivers, technicians)
   - Lack of adequate military training for the actual role
   - Inability to sustain denial: overexposure to casualties, to atrocities, death of friend or relative
3. Physiological conditions
   - Deprivations: sleep, food, water
   - Exhaustion due to weather conditions

Predisposing factors related to the personality of the soldier are less important than those related to the conditions of the battle. The preventive elimination from the army of hypothetically predisposed subjects fails to reduce significantly the incidence of CSR. Predisposed subjects are more prone to develop chronic PTSD, but in acute CSR actual pressure plays the dominant role.

Acute CSR can occur in any person exposed to combat. Consequently, no soldier with CSR should be considered as presenting a trait of mental inadequacy. Similarly, there is no solid ground to look for a record of psychopathology in CSR patients: in the vast majority the result of such an inquiry will be negative. Factors from the subject's history that have been shown to contribute to CSR are recent major life events and CSR in a previous war.

4. THE PRINCIPLES OF TREATMENT

The object of the treatment of CSR is to prevent or to reverse the **traumatic reappraisal** and the resulting stimulus hypersensitivity and avoidance. The treatment of CSR is designed to **stop the transformation of a stressful event into a traumatic event.** It follows two successive stages:

1. An initial withdrawal from the stressful situation, allowing a decrease in arousal and an improvement in the cognitive ability.
2. A deliberate effort to help the subject to evaluate the situation and his own coping resources in a positive way.

An attitude of rejection and denigration towards a soldier with CSR will increase his sense of failure and will diminish or destroy his attempts to regain his capacity to accomplish his combat role. Many still tend to consider CSR as a trait of permanent weakness, or worse, as a form of madness; consequently, they develop rejecting attitudes which are fueled by the pressure of urgent tasks and the sight of the physically wounded as opposed to CSR patients. However, the correct approach is a readiness to reintegrate a soldier into his unit.

5. THE CLINICAL PRESENTATION OF CSR

The natural course of CSR includes a premonitory phase, an acute phase, a phase of stabilization, and either a resolution or post-traumatic stress disorder (PTSD). The intensity, duration and severity of the stressor determine the length or even the presence of each of these phenotypal reactions.

5.1 The premonitory phase

Table 2 shows the typical signs of the premonitory phase. At this phase it is sometimes difficult to distinguish between CSR and reactions of fear and anxiety that are common during combat. Many soldiers are, at times, tense, restless and experience anxiety and fear. There are, however, clinical signs that allow a distinction between the "normal" reaction to combat and CSR in status nascendi. The principle indicators are the following:

1) Emotions are strong enough to interfere with task accomplishment.
2) The level of distress of the individual is significantly more pronounced than that of others who are exposed to the same conditions.
3) Tension is beyond the subject's control and, very typically, does not lessen during periods of relaxation in combat.
4) The subject's behavior or responses seem to others different from his usual character.
5) The subject himself becomes detached and isolated. He "loses contact" and can no longer adjust his emotional tone and his level of activity to those of others (e.g., does not laugh with others, wanders around when everyone is at rest, stays apart while others are together, etc.). Other unit members are often those who recognize the difference and bring the soldier to the attention of medical staff.

Table 2: Premonitory signs of CSR

High arousal:	Restriction of field of interest
	Inability to relax
	Inability to shift attention
	Inability to concentrate
	Disrupted decision making
Emotional dyscontrol:	
	Irritability
	Impulsive responses to stimuli
	Uncontrolled emotional discharge
	Diminished social interaction
	Withdrawal, isolation
	Loss of a sense of humor
	Loss of affective adaptation to others
	Sustained criticism and mistrust
Physiological manifestations of anxiety:	
	Diarrhea, nausea, tremulosness,
	Weakness, cold sweating,
	Headaches, palpitations,
	Unexplained physical complaints serving as a pretext for any consultation

The identification and treatment at this stage are of the utmost importance and their efficiency is maximal. Most of the time, soldiers in this phase will recover after having the opportunity to rest and restore of physiological deficit (in sleep, food, water, protection from extreme weather conditions).

The shift from this phase to the acute phase often follows an additional event to which the subject fails to respond and, therefore, develops symptomatic behavior. This last event is often described as the cause of CSR, but a careful inquiry often reveals a premonitory phase before the onset of the acute phase.

Spontaneous recovery from this phase is also possible - if the battle is over. If not, every additional stress can revert the individual into the acute reaction described below.

5.2 The acute phase

At the acute phase, the functional deficit is total and the subject is overwhelmed by a sense of inescapable catastrophe. The presence of gross psychiatric symptoms is the rule (Table 3).

Table 3: Clinical signs of the acute phase

1. Cognitive impairment:	
	Dissociative states
	Confusion and disorientation
2. Impaired stimulus response:	
	Overreactiveness to stimuli
	Inappropriate response to minor events
3. Psychomotor symptoms:	
	Restlessness and agitation or
	stupor and motor retardation
4. Affective symptoms:	
	Anxiety
	Panic
	Terror
	Sadness
	Guilt
	Shame
	Perplexity
	Stupefaction
	Shock
5. Conversion symptoms:	
	Paralysis
	Blindness
	Muteness

Stupor, panic, various conversions or dissociative states can occupy the scene. Sadness, withdrawal or, on the contrary, agitation and restlessness are frequent. Overreactiveness to minimal stimuli is often present. Confusional states merit particular attention: they often include both disorientation and overreactiveness, which can lead to inconsiderate

exposure to real danger. Psychosis rarely occurs and distortion of reality testing is rare. This should be remembered because it would mean that even at this phase the subject is responsive to external contact and can be reassured, oriented and encouraged. The subject is often unable, at this phase, to process, use or answer adequately to verbal efforts made in order to reach him but preserves his capacity for contact and for recognition of the affective tone of the contact. Subjects at this phase are particularly responsive to the warmth of human touch and can be easily handled that way. Violent body treatment is, on the contrary, of no help and increases the subject's fear and withdrawal. Vigorous maneuvers such as slapping, beating or shaking the subject should be avoided.

5.3 The phase of stabilization

The phase of stabilization occurs within several days or weeks. It is often seen by the primary physician at the end of military operations as the first manifestation of CSR either in subjects who could handle the acute reaction without medical help or in those whose CSR developed insidiously. This is often the case of people in position of command who "cannot afford" breakdown as long as active operations continue. Another circumstance which favors this type of reaction is the first contact with the family at home and particularly the first leave.

The symptomatology of this late reaction is midway between acute CSR and PTSD. It is characterised by the presence of affective symptoms (depression, guilt, shame) along with intrusive thoughts or vivid imageries of an event or a scene from the battle. Sleep disturbances are frequent with ensuing fatigue and nervousness.

This condition should be distinguished from normal grief reactions that accompany at that phase, i.e., the realization of losses. Good indicators of CSR are the persistence of intrusive memories and imageries over time and the presence of nightmares.

5.4 The Post-Traumatic Stress Disorder

In 49% of the subjects, CSR results in PTSD a year after the war. All the clinical varieties of CSR, irrespective to their initial form, may converge into PTSD. Neither the clinical picture of acute CSR, nor the intensity of the dysfunction involved, predict PTSD. PTSD however, occurs with higher incidence in those soldiers with prior to combat psychopathology (including CSR from previous war) and in those who are evacuated and treated in the rear. The significance of the last finding is difficult to evaluate because the evacuation to the rear is often a result of intractable CSR and not its cause. There are, nevertheless, strong indications that evacuation contributes, by itself, to the development of PTSD.

PTSD is a pervasive and potentially chronic condition associated with a massive disruption of the social, familial and professional life of the subject. It may be resistant to treatment after six months of evolution (chronic PTSD according to American Psychiatric Association's Classification of Mental Disorders, third edition). The description of PTSD is beyond the scope of this paper. It is nevertheless important to remember that PTSD is a potential end result of CSR and that the real challenge of treating CSR is the prevention of chronic psychiatric disability.

6. DIAGNOSIS AND TREATMENT OF CSR

6.1 General principles

The treatment of CSR can be defined as a deliberate effort to re-establish pre-existing psychological homeostasis of the subject by providing temporary relief from stress along with biological and social support. The following principles should be observed:

1. Compensate physiological needs.
2. Achieve temporary relief from external sources of stress.

3. Use human contact in order to prevent the soldier from engaging in the process of psychological trauma: i.e., reappraisal of the situation as catastrophic and massive devaluation of his own resources and values. Reassure, clarify, allow sharing of emotions, humanize and legitimize fears, allow expression of guilt for actions or omissions, confront self depreciation but respect personal values and beliefs.
4. Share with the patient an expectation for full recovery and return to duty.
5. Promote social support that will allow reintegration of the subject in the same unit and, if possible, the same role.
6. The sooner one treats CSR, the better the chances are to reverse the process of traumatization.

Table 4: Principles of Treatment

1. Start as soon as possible.
2. Identify and compensate physiological deficits.
3. Protect from additional stress.
4. Use personal contact to orient, reassure, and clarify.
5. Promote social support.
6. Encourage return to duty.
7. Discourage any changes in status or role definition.
8. Complete treatment at the first station that allows temporary relief from external source of stress.
9. Do not evacuate unless of absolute necessity.

CSR involves a massive decrease in the subject's ability to adapt to new situations and to new roles. Any change in the subject's status (such as evacuation to the rear or changes in his military role) should, therefore, be considered as potentially harmful. The benefit of withdrawal from direct source of stress should be weighed against the severely disturbing effects of such a change. As a rule, **the first station in which temporary protection from direct source of stress can be achieved is the one in which the treatment should take place.** This first station may be among the soldier's buddies in the field, in the battalion first aid station or in the field hospital. The status of the soldier as member of a combat team should not be changed unless the proper efforts designed to reverse the traumatic effects of stress have been done.

6.2 Prevention and early intervention

Primary physicians and medics can have an active role in reducing the risk factors to CSR. Preventive interventions on the group level include: (a) counseling commanders on the psychological impact of specific combat conditions (Table 1) and (b) identification and prevention of physiological deficits inflicted on the group.

On the individual level, those who present the premonitory syndrome should be identified and treated. The treatment follows these principles:

1. Start as soon as possible.
2. Compensate physiological needs (the "Chicken Soup" treatment).
3. Allow stress relief - by having the subjects rest for a limited time.
4. Provide personal support by allowing the expression of fears and anxieties, showing their common nature (many soldiers at that phase fear "losing face," feel ashamed, and tend to conceal such emotions).
5. Encourage the subject, his peers, and his commanders to consider the temporary failure as acceptable and plan full return to duty. Direct communication with commanders and fellow soldiers is an extremely important aspect of the treatment program.

The specific goal of the treatment at that phase is to prevent the subject from isolating himself from others and from engaging in an experience of loneliness and detachment.

Tranquilizers should be avoided. Subjects respond to suggestion and can easily be handled by the competence and the authority of a medical officer. Some authors report, however, that the administration of mild doses of minor tranquilizers has proven successful to promote sleep in some soldiers with prolonged sleep deprivation.

6.3 First echelon treatment

When CSR occurs during active combat, particular attention should be paid to potentially dangerous behavior due to dissociative states, disorientation or agitation. The soldier should be contained and protected from exposing himself to firing or from losing contact with his unit. This is the principle role of the medic during the battle in the field. It should be emphasized here again that not every emotional reaction is CSR - most of them are normal reactions that are well contained by the subject's friends. The following triad can help to distinguish CSR from normal emotional reaction:

1. Task accomplishment is disturbed.
2. Social contacts are impaired.
3. Gross emotions or modifications of behavior are present and do not improve with rest.

Furthermore, we should not forget that anxiety can result from bleeding and that stuporous states may result from brain commotion. The patient should have a thorough physical examination.

6.4 Second echelon treatment

The medical aid station is usually the last station in which the subject is still within his unit and can enjoy support from peers and rapidly integrate his functions. Whenever the battle conditions allow it, CSR patients should remain in the battalion medical aid station for 24 to 48 hours. The treatment follows the following schedule:

1. Assess for medical and surgical trauma.
2. Record accurately elements of the trauma. The information obtained at that phase is invaluable: memories of the battle are often repressed or distorted by the subject and cannot be obtained in the following stations.
3. Orient the subject in time, space, events, and treatment plan.
4. Restore physiological needs.
5. Reassure. Use empathy to promote self value and dignity.
6. Have the soldier rest for as much as needed (6 to 24 hours).
7. Reactivate by starting tasks related to the activity of the medical aid station.
8. Return to duties - having arranged for proper acceptance by peers and commanders.

6.5 The field hospital

The principles discussed above should be observed in the field hospital with the following differences: (a) The field hospital is the first station in which the soldier is disconnected from his group. The psychological impact of this separation is significant: not only does he lose contact with comrades and commanders but he is often deprived of his belongings, his personal weapon is taken away, and he finds himself coping within circumstances for which he was never trained and handled by professionals who have yet to gain his confidence. At the same time, he gains an official status of a "patient" and not less important - of a mental patient. All these changes add to his preexisting difficulties. (b) On the other hand, the field hospital is the first place in which professional help can be provided and where necessary time and sheltered space are available.

The psychiatric unit in the field hospital must accomplish a double task: on one hand, military atmosphere and discipline should be maintained in order to convey a message of potential return to duties, on the other hand, rest and individual relaxation should be enabled in order to promote psychological reintegration. The professional team should be specifically trained for this type of intervention. Soldiers should remain dressed in their uniforms and maintain military discipline. They should be prevented from regressing to the sick-role implied by lying on stretchers or beds. Evacuation to the rear will be avoided and the general expectation will be to return the soldiers to their units.

The time allowed in a field hospital will vary from 48 hours to seven days according to the conditions of combat and to the availability of staff.

Professional treatment, planned for as long as a week, will include individual and group therapy and progressive, but active, confrontation with objects of avoidance (e.g., weapons, tanks, etc.). It is unwise to attempt, at this stage, an explorative therapy of the trauma or of any of the subject's basic conflicts. The overall goal of treatment is, still, the reinforcement of previous defenses and coping mechanisms with respect to the subject as he was before. No changes in personality or in habits should be aimed at in this phase.

All CSR patients in the field hospital are expected to return to duty and such an expectation has to be explicitly shared with the soldiers. In fact, 70% to 93% of the patients can be returned to their units at this stage (as opposed to 30% full return to duty from the base hospital).

Differential diagnosis at that stage is with **psychosis** and **malingering**. The rare cases of psychosis occur most often in patients with previous history of mental illness. Delusions, hallucinations and impaired reality testing distinguish psychosis from CSR. Psychotic patients should be evacuated immediately and, if needed, treated with major tranquilizers.

Medical officers who are not specialized in the treatment of CSR can provide adequate help for 48 hours by compensating physiological needs and allowing withdrawal from threat. They will succeed in a large proportion of CSR patients. This should be preferred over the immediate evacuation.

The decision to reintegrate a soldier into his unit is made on the basis of renewed ability to function and a decrease in anxiety attested by the ability to relax, to concentrate and to be emotionally "attuned" to the group.

6.6 The rear echelon hospital

The base hospital receives CSR patients from three different sources: (a) soldiers who failed to improve in previous stations, (b) soldiers who have been evacuated without previous intervention (mostly by air), and (c) soldiers whose CSR manifested itself for the first time or was aggravated during periods spent in the rear. The base hospital should not function as a primary care facility. Its role in groups (b) and (c)

is to identify cases of CSR and arrange for their integration in a more advanced treatment facility.

For soldiers who failed to respond to previous treatments, it should be assumed that such a failure often resulted from the absence of adequate conditions in the field (e.g., absence of professional help in a particular field hospital, battle conditions that imposed rapid evacuation, hasty decisions to evacuate, etc.). The resulting therapeutic attitude is a renewed effort to reverse the process of traumatization. Military atmosphere and discipline should therefore be maintained, and the expectation for return to duties explicitly conveyed.

The advantage of the base hospital is to provide skilled professional help and to attempt an exploration of the traumatic experience and an elaboration of its meaning for the patient. Individual and group psychotherapy are the main tools for achieving these goals.

Attempts at recalling events and expressing emotions related to them (abreaction) can be done if highly skilled professionals are present. Suggestion or hypnotic induction are the basic techniques. Barbiturates and sedatives have never been shown to function better than suggestion. Repressed memories are not the unique cause of CSR and PTSD. This old assumption has been challenged and abreaction is not considered as mandatory. However, in those of the soldiers who do abreact at recalling repressed memories during treatment, this is often a turning point.

Behavioral psychotherapy has an important role in attempting to end specific avoidance.

Pharmacotherapy, including antidepressants, should be attempted in seriously depressed soldiers and in those manifesting panic attacks.

As a whole, the base hospital allows more individualized approach to CSR patients, including controlled regression, exploration of specific areas of conflicts and specific configuration of the trauma. The therapy is, nevertheless, time limited, focused and basically supportive.

7. CONCLUSIONS

CSR is an universal phenomenon which constantly accompanies warfare. The incidence of CSR depends largely on variables of the combat and the way units are trained and prepared for it. The number of definite casualties from CSR and their severity depends on the availability of adequate help in time and on the firm and supportive attitude of treating personnel and commanding staff. The policy of prompt treatment reduces definite casualties in a proportion of 1:5. The reason for such a difference resides in the fact that **the trauma related to CSR is a relatively long process which can often be reversed by proper intervention in time.**

CSR can be recognized in early stages by the presence of irreducible anxiety, impaired social function and stimulus dysregulation. In the acute phase, CSR comprises severe cognitive and emotional dysfunction with inability to follow task oriented activity. Acute psychiatric symptoms including conversions, stupor, dissociative states and acute anxiety states are present. This clinical picture can evolve into PTSD when intrusive memories and systematic avoidance of stimuli progressively replace the signs of the acute phase. This development leaves the individual the victim of an endless repetition of his traumatic experience of the war.

The treatment of CSR is basically the same in all the stations and includes protection from external sources of stress, compensation of physiological losses, firm supportive and humanizing intervention, reactivation and reintegration. Rejecting and isolating attitudes are frequently encountered and should be avoided. One can expect up to 70% to 90% of recovery rate from early intervention conducted within the military corps of the soldier and a 30% to 50% rate of return to duty from later treatment.

Chemical and biological warfare adds another dimension to this traditional form of combat stress reaction. It is, however, important to be aware of this "classical" description in order to be able to assess differences and similarities. The principle of "traumatic reappraisal" remains true for both CBW and non-CBW environments. Different symptoms may, however, occur - even without chemical intoxication - the expression of CSR being, often, shaped by imitation, desirability and ease in obtaining medical attention.

FURTHER READING

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